

THE
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FRIDAY, APRIL 28, 1961

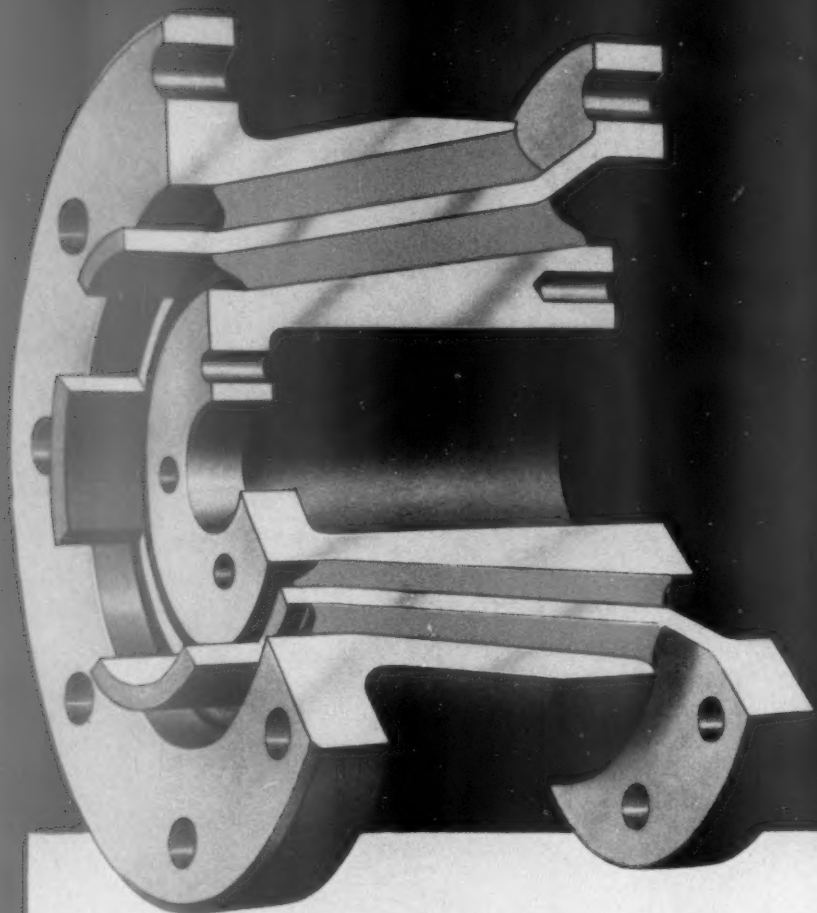
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ELASTIC RAIL SPIKE CO. LTD.

41-43, MINCING LANE, LONDON, E.C.3



Double-cone couplings

(PATENTED)

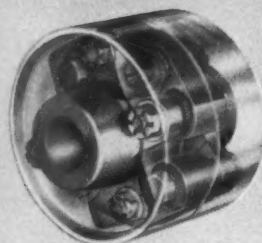
*Damp Torsional Vibration, Resist Thrust,
Absorb Shock Loads*

A high degree of torsional flexibility combined with large torque capacity singles out the Double-Cone Coupling for drives in which torque fluctuations and torsional vibration must be controlled.

The design is suitable for torques up to 100,000 lb. ins. and torsional deflections from 5°-10°. It permits some angular misalignment and is designed to resist end thrust.

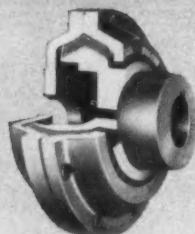
Available in a number of standard sizes, the Double-Cone Coupling is of robust construction and requires no maintenance.

SOME OTHER METALASTIK COUPLINGS



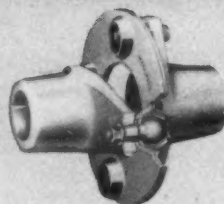
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Accommodates exceptional parallel misalignment. In range of sizes to transmit 1-20 h.p. per 100 r.p.m.



BICONE

For marine and other applications, transmits thrust, absorbs torsional vibration and accommodates misalignment. For drives of 5-10 h.p. per 100 r.p.m.



UNIVERSAL

Accommodates a large amount of angular misalignment with very low resistance. In sizes to transmit 0.3-3 h.p. per 100 r.p.m.

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By courtesy of Rhodesia Railways

UNIT CONSTRUCTION is one of the MODERN FEATURES

BRITISH DESIGN AND MANUFACTURE

The unit construction of the modern Westinghouse centralised traffic control machine permits the addition of further unit sections which can be inserted at any point in the machine, connections being made to terminal blocks in each unit. The storage units in each section are plug-connected for easy removal for maintenance.

The machine illustrated above was built and installed by WESTINGHOUSE for RHODESIA RAILWAYS and will eventually control main-line train movements between Gatooma and Headlands, a distance of 184 miles. A similar machine has controlled traffic on the 85-mile section between Mpopoma and Gwaai since 1958.

WESTINGHOUSE BRAKE AND SIGNAL CO. LTD., 82 York Way, King's Cross, London, N.1

Saxby & Farmer (India) Private Ltd., Calcutta.

Westinghouse Brake & Signal Co., S.A. (Pty.) Ltd., Johannesburg.

McKenzie & Holland (Australia) Pty., Ltd., Melbourne.

Agents—Bellamy & Lambie, Johannesburg.

BRITISH RAILWAYS ACHIEVE THE OPTIMUM IN ECONOMICAL HANDLING WITH COLES

During 3 years continuous service at Swindon Wagon Works, a Coles self-propelled 'ARGUS' crane has given "complete satisfaction", reports British Railways (Western Region). The crane is used exclusively for handling scrap metal, and its introduction has resulted in increased economies, enabling five men to be released for other work.

Records show that for an 8 hour shift—during which a maximum scrap throughput of 100 tons has been achieved—fuel consumption has averaged only 2½ gallons.



COLES^{*}
CRANES

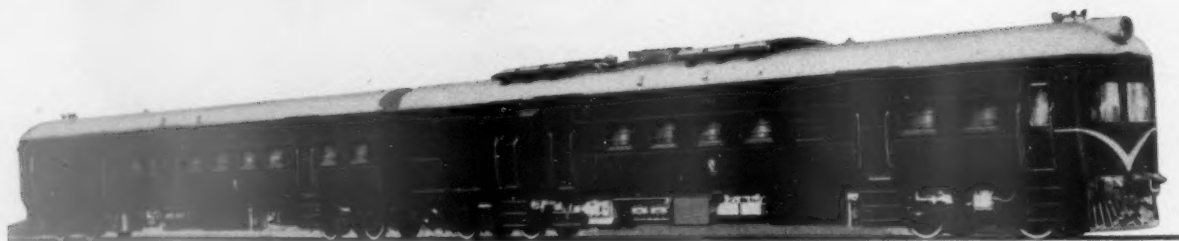
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DREWRY RAIL CARS

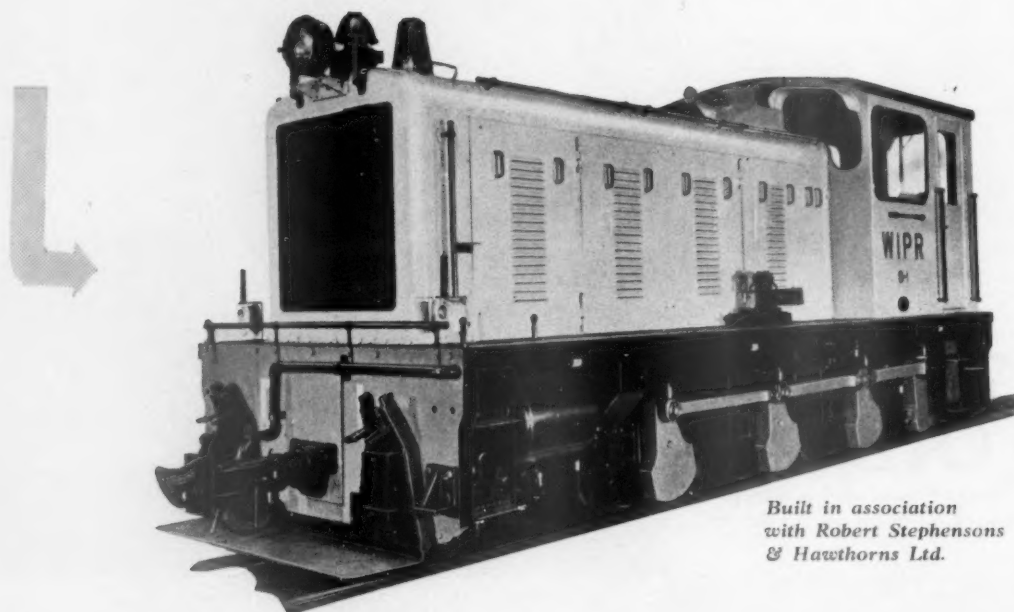


*Built in association with
The Birmingham Railway Carriage
& Wagon Co. Ltd.*

WITH MECHANICAL OR HYDRO-MECHANICAL TRANSMISSION

The upper illustration shows one of two Twin Car Units shipped this year to the Nigerian Railway Corporation, equipped with twin underfloor engines totalling 400 h.p. and multiple-speed epicyclic transmission with automatic control. The lower illustration is one of a number of 30-ton metre gauge Drewry locomotives recently shipped to Portuguese India, for freight and passenger duties.

AND LOCOMOTIVES



*Built in association
with Robert Stephenson
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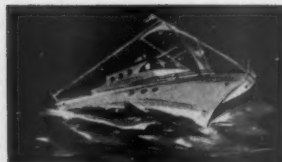
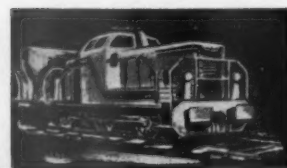
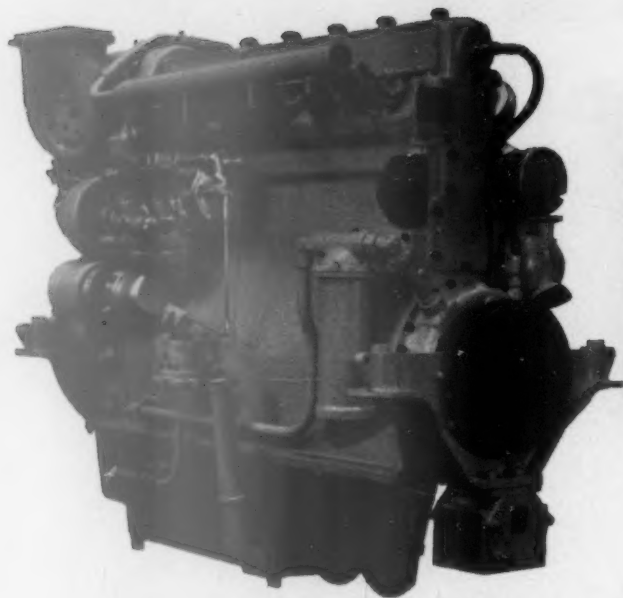
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the engine which is given the most varied applications



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It is indispensable wherever a cheap source of motive power and a machine with reduced floor-space are required.

The 175 C.O. type engine has been designed so as to combine the qualities of robustness, long life and low running costs of the slow-speed heavy engines with the advantages of light-weight, reduced floor-space occupied and low purchasing costs of the high-speed engines.

The 175 C.O. type engine, such as it is designed and built, shows all these advantages.

- square engine with light connecting rod system and moderate speed,
- crankshaft rotating in roller bearings with crankcase-tunnel: perfect rigidity of the assembly,
- overhead camshaft: accurate control of the valve movements,
- large-capacity water pump: even temperature in the cylinder blocks and cylinder heads,
- double oil sump and double oil pump: contact minimized between oil and combustion gas, longer life for the oil bath,
- high rigidity of the cylinders and high water pressure: no cavitation, no erosion,
- all auxiliaries are gear-driven: no chain, no belt,
- the filtering of fuel, oil and air is of the highest efficiency,
- the Ricardo Comet V pre-combustion chamber permits the use of low grade fuels.

Whichever is the problem you are faced with, a 175 C.O. type engine is the solution.

Apply to our Departments; their specialists will help you efficiently.

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Each half of coupling seals itself when disconnected and withstands full line pressure.

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THE MILLS RAIL

PATENT

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Whenever a Mills Clip
is fitted, it is fitted
correctly.



Photograph by
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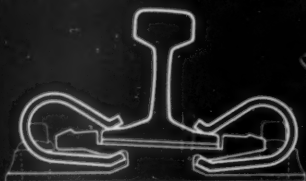


EXORS OF JAMES MILLS LTD

BREDBURY STEEL WORKS

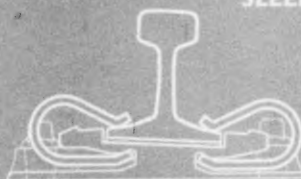
CLIP

FOR WOOD SLEEPERS



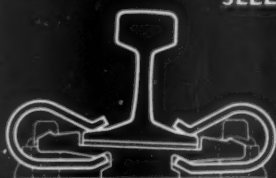
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with or without
rubber rail pad.

FOR 'E' TYPE CONCRETE
SLEEPERS



Two-hole baseplate,
interchangeable with
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Small Area
two-hole baseplate
for main line use.

Every Mills Clip fitted applies
a uniform load to the rail
within a known range.

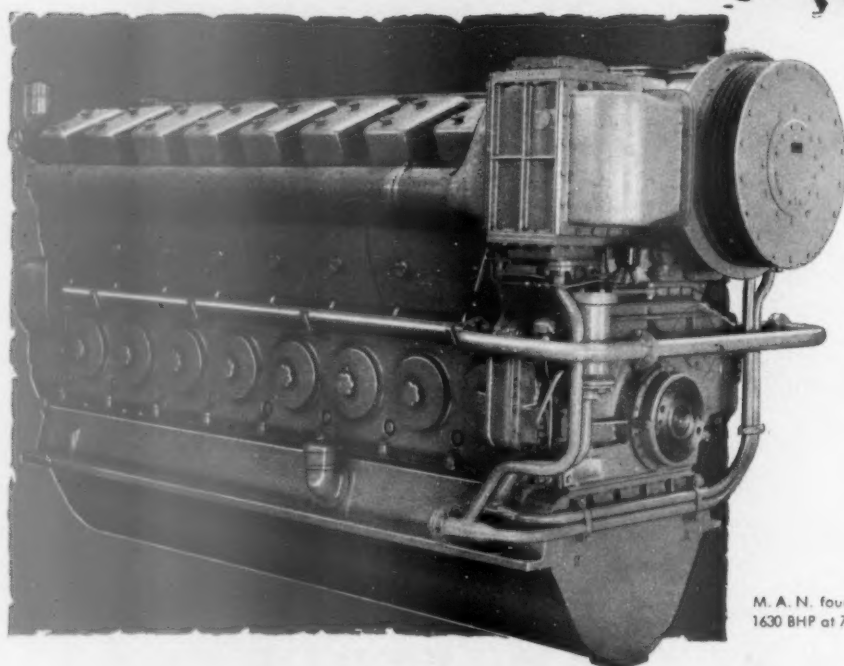
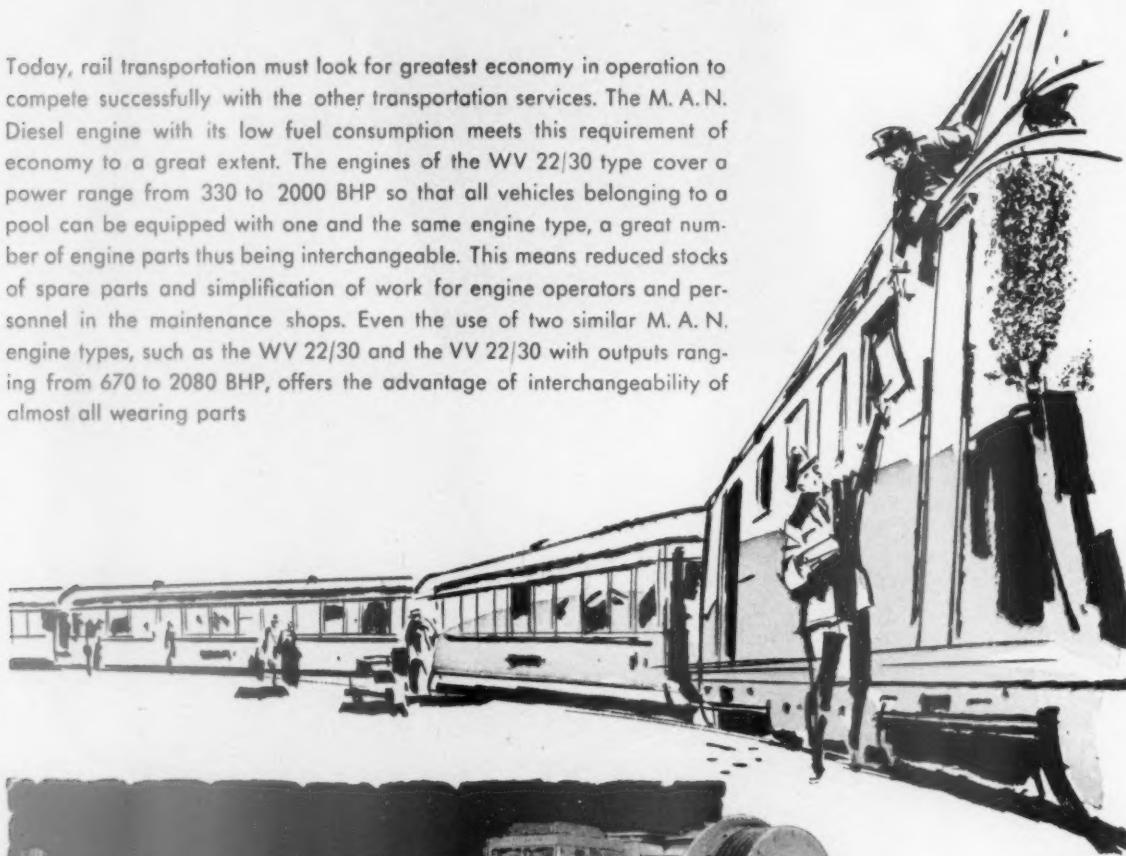
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Today, rail transportation must look for greatest economy in operation to compete successfully with the other transportation services. The M. A. N. Diesel engine with its low fuel consumption meets this requirement of economy to a great extent. The engines of the WV 22/30 type cover a power range from 330 to 2000 BHP so that all vehicles belonging to a pool can be equipped with one and the same engine type, a great number of engine parts thus being interchangeable. This means reduced stocks of spare parts and simplification of work for engine operators and personnel in the maintenance shops. Even the use of two similar M. A. N. engine types, such as the WV 22/30 and the VV 22/30 with outputs ranging from 670 to 2080 BHP, offers the advantage of interchangeability of almost all wearing parts



M. A. N. four-stroke Diesel Engine type V 8 V 22/30,
1630 BHP at 750 r. p. m. or 2000 BHP at 950 r. p. m.

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GENERAL MOTORS LOCOMOTIVES

... scientific packaging protects
parts in shipment and in storage!

This picture of a carton of exhaust valves goes a long way to explain what we mean by scientific packaging which protects General Motors locomotive parts both in shipment and in storage.

The carton itself is engineered for strength and light weight. No chance for parts to rattle around and become damaged during shipment or normal handling. And shipping costs are kept to a minimum.

VPI Wrap for rust prevention

All metal parts are packed with VPI, a paper that gives off a vapour which positively prevents corrosion. More than a decade of use has proved the effectiveness of this clean, lightweight vapour-phase corrosion inhibitor. Parts sealed in their cartons stay *factory-fresh*! And because there's no greasing or spray-coating required, the costly and involved process of degreasing is eliminated. Parts can be used immediately upon unpacking.

Exclusive skin packaging

Another development for protection of gaskets and other small parts is skin packaging. A transparent film, tightly vacuum-sealed over the contents, provides immediate visual identification without the package being opened. Gaskets retain natural moisture—won't dry out or shrink even when stored for a year or more.

The thoroughness of General Motors parts packaging is worth keeping in mind when you are in the market for Diesel locomotives. It's one of the smaller, yet nonetheless important reasons why General Motors locomotives *cost less in the long run*.

GENERAL MOTORS OVERSEAS OPERATIONS

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SOUTH AFRICA—Union Carriage & Wagon Co. (Pty.) Ltd., Nigel, Transvaal • SPAIN—Material y Construcciones, S.A., Barcelona
SWEDEN—Nydqvist & Holm Aktiebolag, Trollhattan

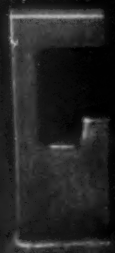
LOCOMOTIVE PLANTS: Electro-Motive Division of General Motors, La Grange, Illinois, U. S. A. General Motors Diesel Limited, London, Ontario, Canada

World's Highest Standard—270 to 2600 H.P.


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LOCOMOTIVES





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AND CHEAPEST WAY OF FIXING
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OR ATTACHMENTS LIKE THESE
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Isothermos modern mechanically lubricated axleboxes of the "Athermos" type meet all requirements of modern railways

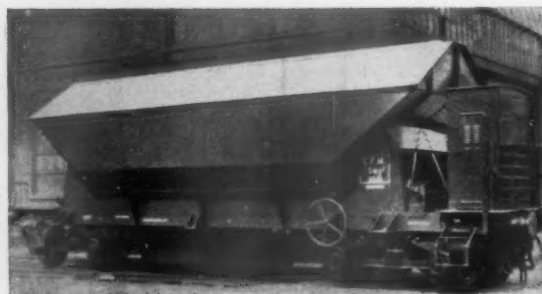
ISOTHERMOS axleboxes are in the forefront of the technics of railway journal lubrication, having gained THE WORLD SPEED (205 m.p.h.) AND ENDURANCE (405,000 MILES) records when fitted to French National Railways Electric Locomotives.

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Hellenic State Railways



Moroccan Railways (Phosphate ore)



10,000 Spanish State Railways 20-ton wagons



1,500 Danish State Railways wagons



French National Railways, International Union of Railways standardised wagons



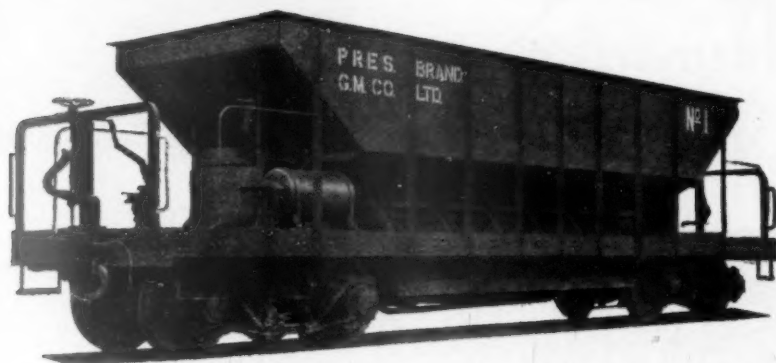
5,000 Turkish State Railways wagons

SOCIÉTÉ INTERNATIONALE DES APPLICATIONS ISOTHERMOS

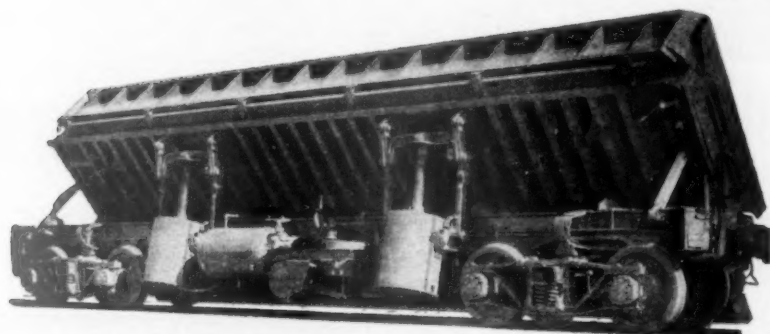
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Exclusive Licensees in Great Britain: **F. H. LLOYD & CO. LTD.**, JAMES BRIDGE STEEL WORKS, Nr. WEDNESBURY, STAFFS., ENGLAND

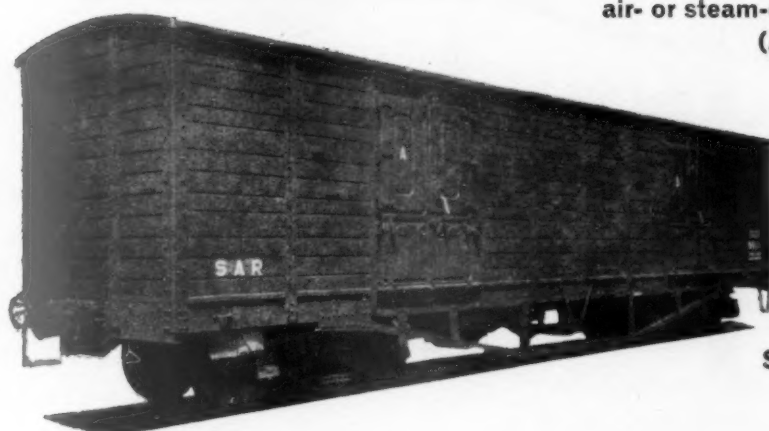
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50 Ton Ore Hopper Wagon



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air- or steam-operated Dump Wagon
(Austin-Western patent)



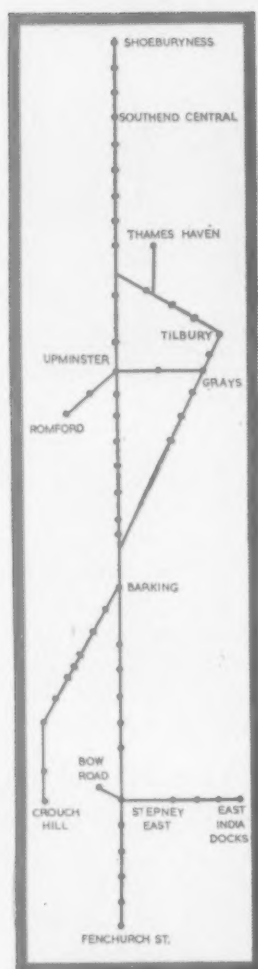
South African Railways
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STC

and railway modernisation



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The aluminium sheath provides screening against induction from the traction system.

A feature of the corrugated aluminium sheathing is its improved flexibility during installation.

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0.050 in. (1.27 mm)
Conductors,
Aluminium Sheathed
and P.V.C. protected.

another STC communication cable project for British Railways

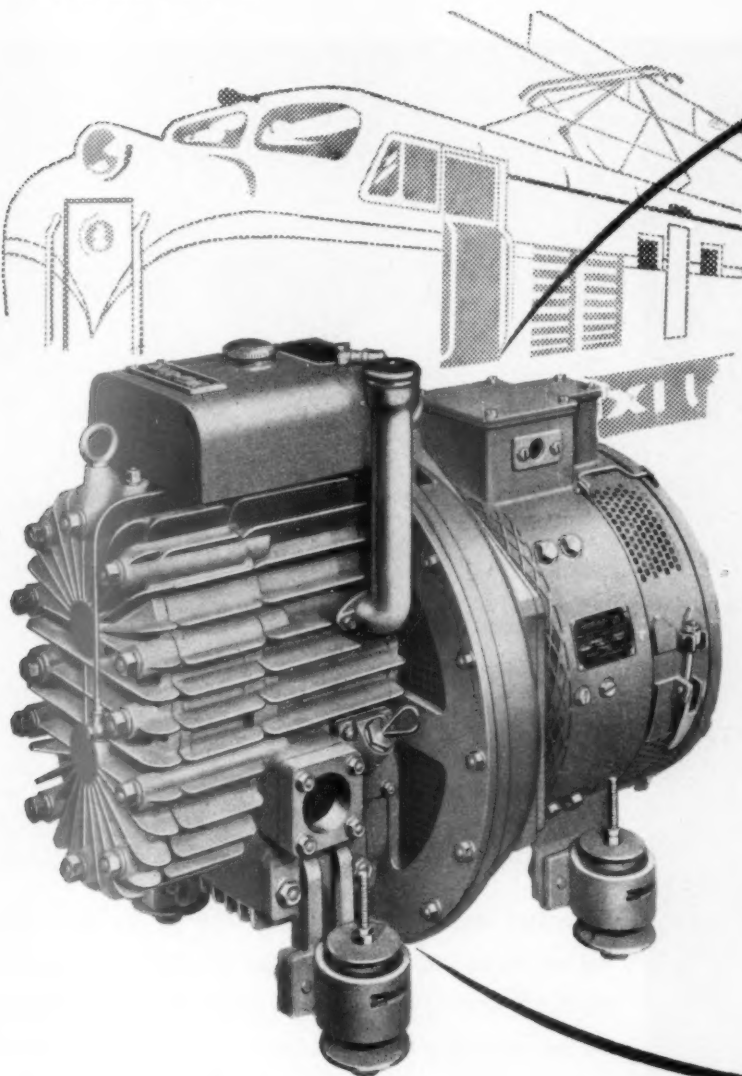
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61/9B



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TYPE 125 R.E.F.M.
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VOLUME 125 c.f.m.

NOTE: Large capacity
(250 c.f.m.) machine
also available.

*Northey Exhausters are
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- *sets new minimum space and minimum weight standards for Diesel and Electric Locomotives*
- Exhauster weighs only 205 lbs. Length overall (with motor) approx: 30 inches.
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- 21" Hg Vacuum against $\frac{3}{8}$ " leak hole. Guaranteed oil consumption not exceeding 1 gallon per 1000 hours running. Now in full production for Diesel
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The **POSITIVE** elastic fastening

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The photograph on the left shows the Hey-back System in use near Neasden on an electric track of the London Transport Executive, whose permission to reproduce this photograph is gratefully acknowledged. Further technical data gladly supplied on request.

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THE UNITED
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W109 a



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right
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Consider these advantages

— No metallic dust.
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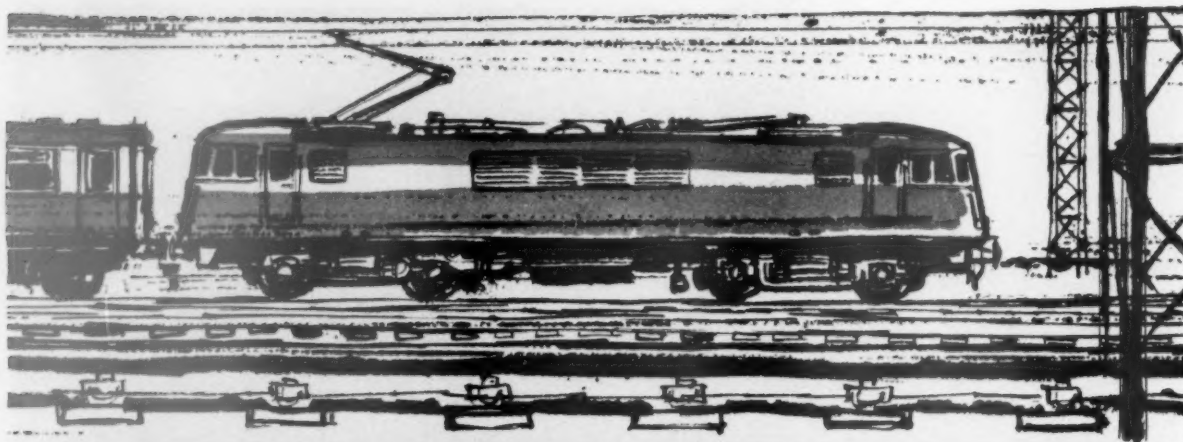
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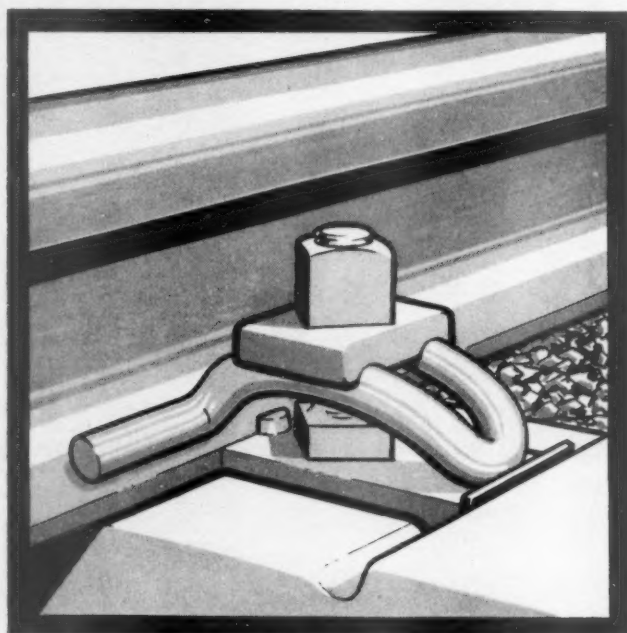
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KEEP TRACK

Today's 100 m.p.h. traffic makes big demands on the track. To help cope with this problem, Bayliss, Jones & Bayliss have developed resilient rail fastenings for use with concrete sleepers and long welded rails. Approved by the British Transport Commission, these tough spring steel fastenings are the latest additions to the BJB range, which still includes, of course, many traditional types of fastening.



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London Office: GKN House, 22 Kingsway, London, W.C.2. Tel: CHA 1616



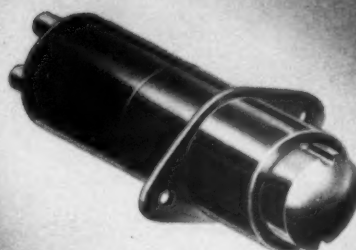
DOWTY

ELECTRICAL COMPONENTS



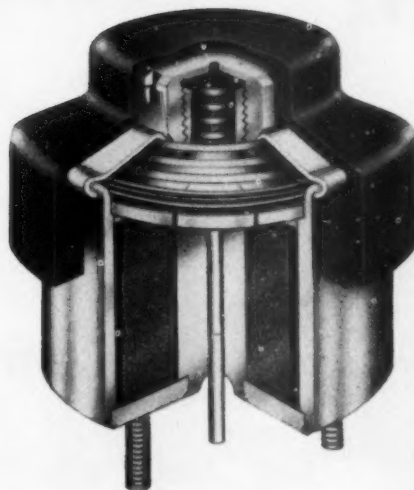
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A fully weatherproofed miniature spring return button switch with a maximum contact rating of 5 amps. Double-pole action with a variety of make and break contact arrangements.



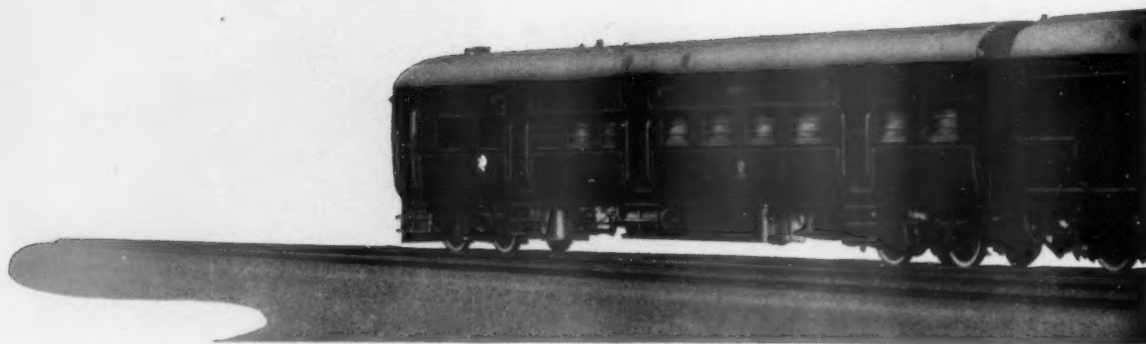
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A special articulated yoke construction gives exceptionally high performance with low weight and robustness.

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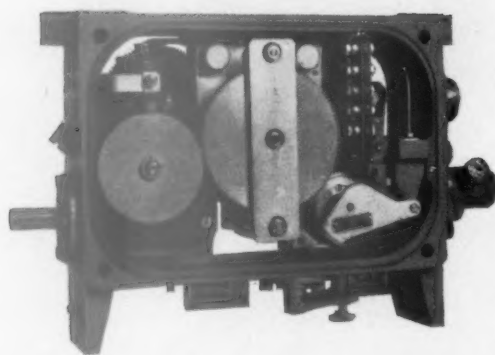


The Nigerian Railway Corporation have recently put into service two of these Twin Unit Diesel Railcars, supplied by the Drewry Car Co. Ltd., and built by Birmingham Railway Carriage & Wagon Co. Ltd. Each unit is fitted with Metcalfe-Oerlikon Patent Safety & Vigilance Control Equipment.

ANOTHER INSTALLATION OF THE

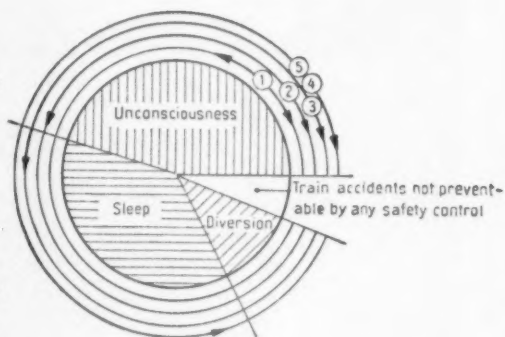


Automatic Safety &

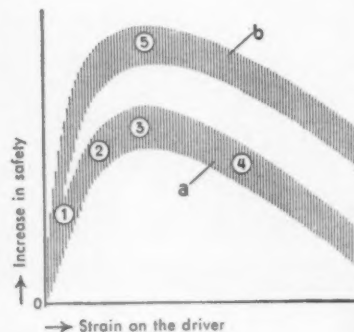


View of the safety side of the apparatus with the covers removed.

- 1 Normal Deadman's pedal.
- 2 Encased pedal for instep.
- 3 Sewing machine type pedal.
- 4 Pedal which must be periodically released.
- 5 Normal Deadman's pedal connected with the PATENT SAFETY and VIGILANCE CONTROL SYSTEM.



- a Range of existing safety controls with pedals.
 - b Range of the Metcalfe-Oerlikon safety control.
- 1-5 Various pedal arrangements as fig. 1.



THESE CHARTS ILLUSTRATE THE SUPERIOR CONDITIONS AND RANGE OF SAFETY OBTAINED FROM THE SAFETY AND VIGILANCE CONTROL SYSTEM.

For full description write for leaflet A.41

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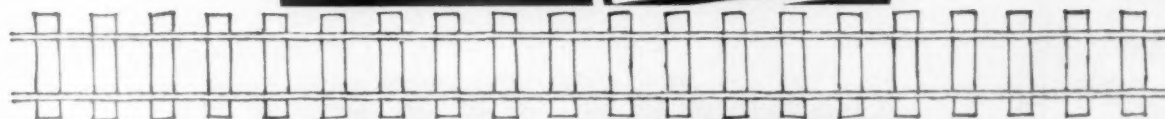
A particularly important feature is the automatic cancellation of the equipment by the Driver's normal operation of his controls, including the Master Controller, Brake Valves, etc. This arrangement together with operation on a distant cycle relieves the Driver of distraction or additional responsibility whilst at the same time providing the maximum range of safety. The equipment which has proved to be very popular with Drivers is easily fitted to new or existing locomotives and is suitable for use with all types of Brake Equipment.

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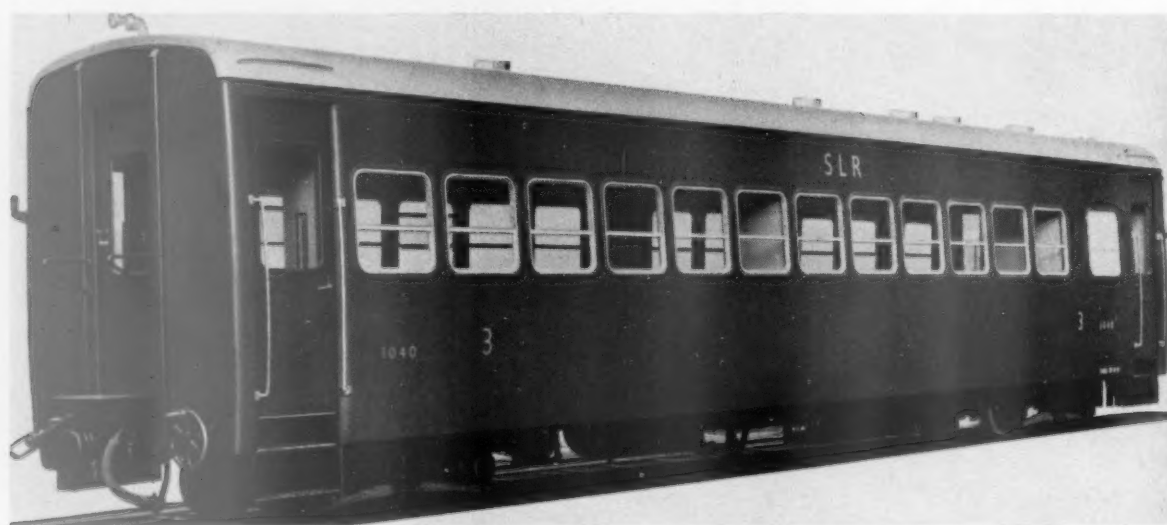
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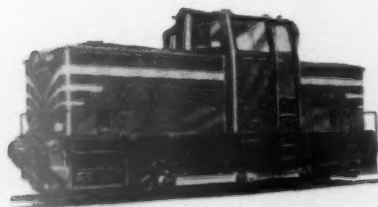
The illustration shows a third class coach, part of an order for 45 1st, 2nd, 3rd class and baggage coaches placed by Sierra Leone Government Railway with Gloucester.



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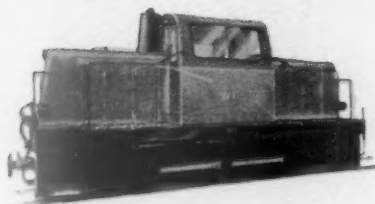


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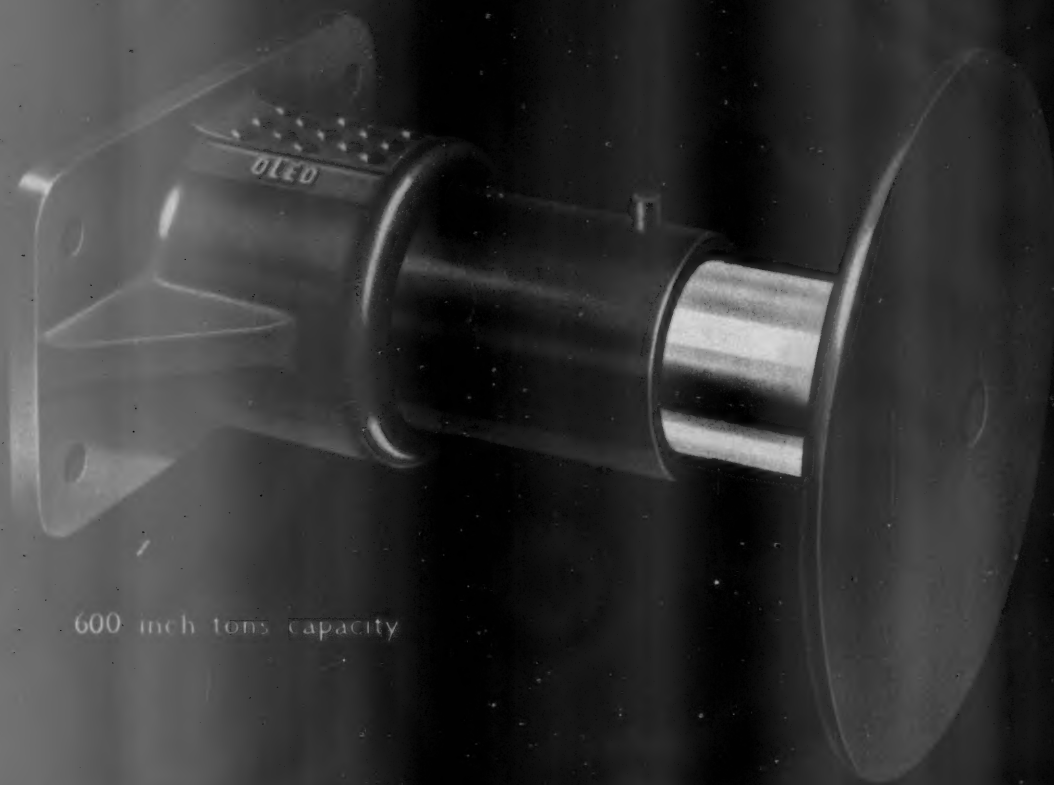
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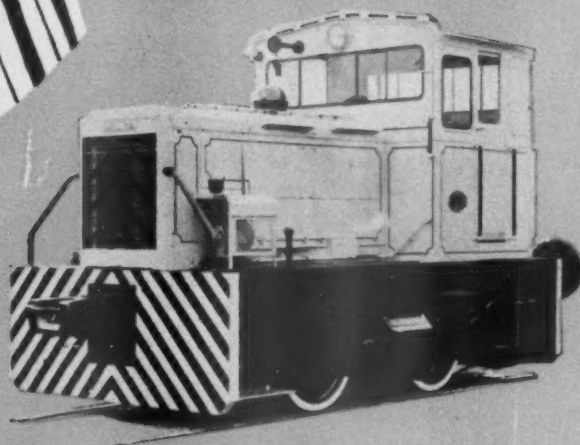
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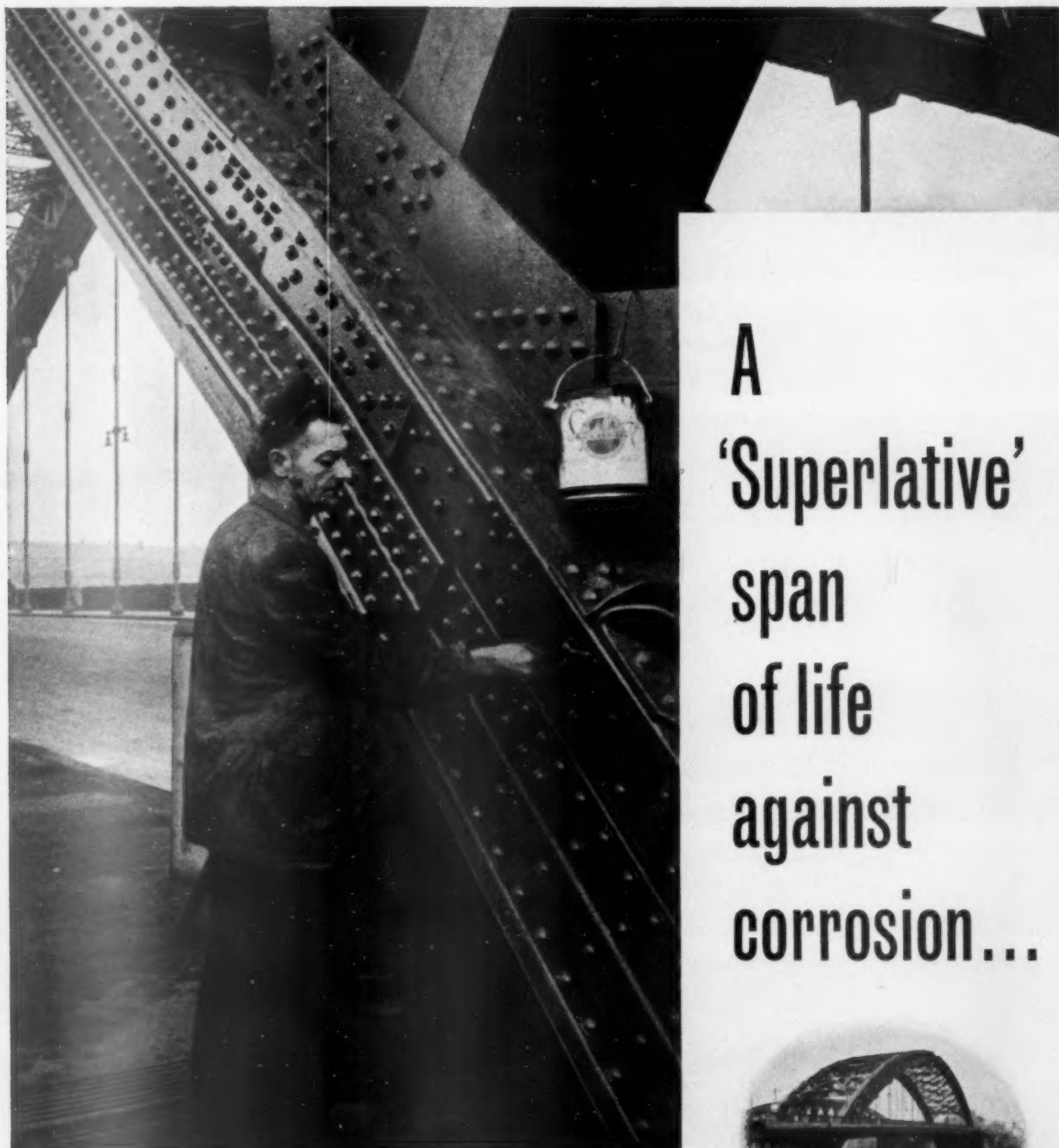
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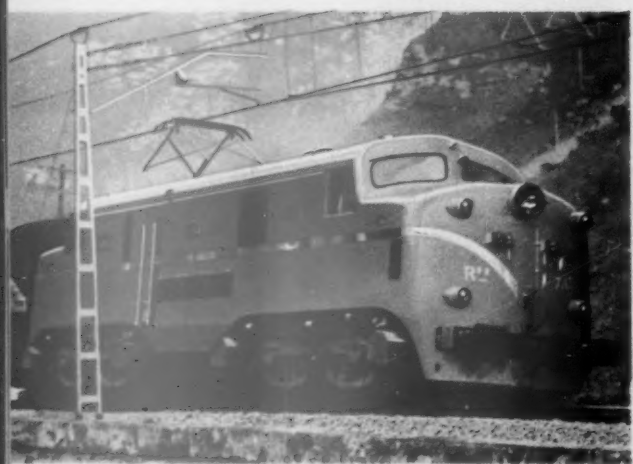
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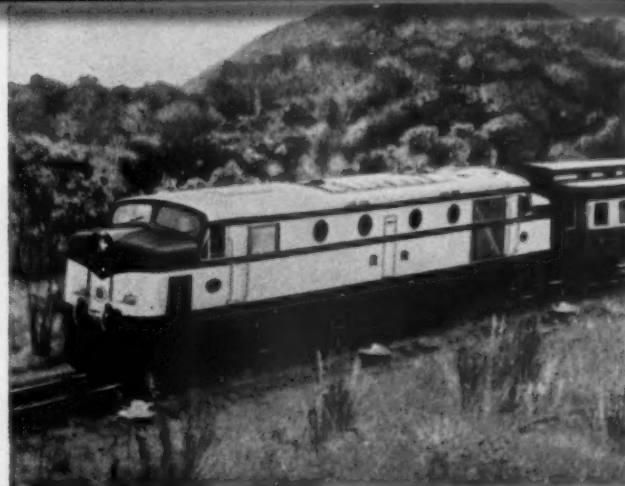
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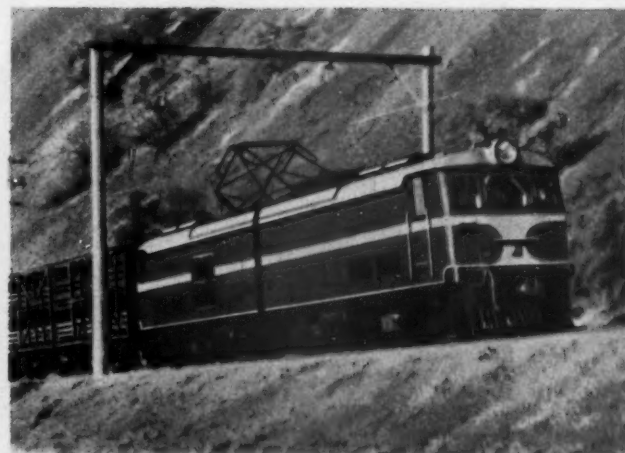
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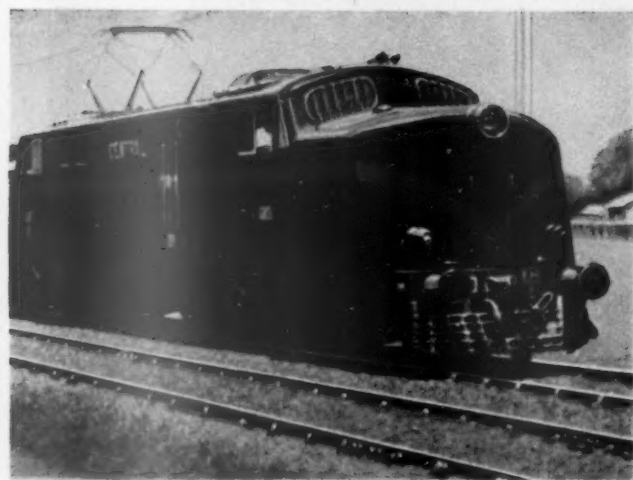
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A journal of Management, Engineering and Operation

VOL 114

FRIDAY APRIL 28 1961

No. 17

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Railway working week

THE pressure for a shorter working week, which has been manifest in many sections of industry, has resulted on the railways in talks between the management and trades union and in a suggestion by the British Transport Commission that working parties should be set up representative of the unions and the Commission to study the problem. The negotiations, so far, have fallen into two main categories. British Railways salaried and conciliation staffs have made an application for a shorter working week through the Railway Staff National Council. In reply the British Transport Commission has said that provided satisfactory arrangements could be agreed about the manner in which the reduction in the working week could be implemented so as to ensure its efficient and economic application, it would be prepared to give favourable consideration to a reduction in the standard weekly working hours to 42 for conciliation staff and 40 for salaried staff. The Commission went on to suggest that a joint working party of representatives of the Commission and of the National Union

of Railwaymen, Associated Society of Locomotive Engineers & Firemen, and the Transport Salaried Staffs' Association should be set up to examine the problems involved. The union representatives stated that they would report back to their executive committees and inform the Commission of the views of those bodies. When the railway shopmen made a like claim at a meeting of the Railway Shopmen's National Council, a similar reply was given by the British Transport Commission, and it was suggested that favourable consideration would be given to a 42-hr. week for shopmen. In this case the working party would comprise representatives of both sides of the Council. In this instance, also, the employees' side undertook to consider the proposal and to let the employer's side know its decision. Obviously, a great deal will turn on the agreement as to the method of implementing a shorter working week, but there can be no doubt that to do so must add very substantially to the labour costs of the Commission. Particularly in the case of conciliation and workshops staff, the 42-hr. week would involve higher rates of payment for overtime and weekend working.

Changes at Metro-Cammell

MR. NORMAN EDWARDS, one of the best-known figures in the carriage and wagon building industry, is resigning from the chairmanship of Metropolitan-Cammell Carriage & Wagon Co. Ltd. at the end of this month. He is being succeeded by Sir Ralf Emerson, who has a wide experience of railways overseas, particularly those of India and Nigeria. He has held high appointments in both countries, as well as having considerable industrial experience in this country. Mr. Edwards has served Metro-Cammell, and its predecessor companies for 51 years. He has been indefatigable in his efforts to promote the business not only of his own company but also of British rolling stock builders as a whole in overseas markets. He became Managing Director in 1954 and followed the late Sir Archibald Boyd as Chairman in 1959. The company will not lose his long experience in the rolling stock industry, for he will remain on the board. Sir James Reid Young, who is retiring from the board, will be succeeded by Mr. A. H. Hird.

Mansion House Association on Transport

FORMED as the London Sugar Trades Rates Committee, in 1881, and renamed the Railway & Canal Traders Association, in 1882, to combat the alleged evils of the railway and canal companies, the Mansion House Association on Transport has developed into a body which can influence the future planning of the transport system of this country. The Minister of Transport seeks its views on transport legislation before making regulations under the Transport Acts, and a committee of Members of Parliament keeps traders' points of view well to the fore. The appointment of a Chairman of the council of the Mansion House Association on Transport would be a subject for careful consideration and the choice must eventually fall on a man well versed in the transport industry. The election of Mr. Ernest Young, who has been occupied with transport

problems for many years, promises to be one which will go far to further the objectives for which the association was formed. Reference to the appointment is made in our personal pages this week.

Diesel Engineers & Users' Association

THE Diesel Engineers & Users' Association held its annual luncheon at the Connaught Rooms, in London, on April 13. The chair was taken by the President, Mr. W. A. Parker. Mr. A. G. Howe, proposing the toast of "The Guests," included in his welcome Mr. D. C. Brown, Chief Mechanical Engineer of the Crown Agents and President of the Institution of Locomotive Engineers and referred to the important position in the engineering world which is occupied by Professor O. A. Saunders, the chief guest. Replying, Professor Saunders said that successful society centred round the diesel engine, which is one of the most successful forms of mechanical engineering. The President, who proposed "The Association," said that from small beginnings it had grown into an international body. As a user he paid a tribute to the British engine designers and manufacturers who had produced such reliable and efficient prime movers—despite popular-press reports on diesel trains.

Crewe-Liverpool re-signalling

THE electrification of the Crewe-Liverpool section of the London Midland Region is being accompanied by considerable track re-alignment and by complete re-signalling. Complete track-circuiting and colour-light signals are being installed throughout, train describers are replacing block instruments, many signalboxes have been closed, and others re-equipped with electro-mechanical frames. At Weaver Junction, where the Liverpool lines diverge from those to Preston and the North, a new route-setting panel has been installed. This is described elsewhere in this issue. The panel is extremely neat and compact, and operates with push-buttons on the "DP" principle, which is akin to the "entrance-exit" system. The new layout provides ample facilities for dealing with trains at this key junction, and the main junction points in both directions have been re-aligned for high-speed running, with a consequent increase in line capacity. Altogether this is a fine example of the new signalling methods designed to play their essential part in the modernisation schemes.

Meeting the public

WHEN structural alteration and decoration of a shop is in progress normal business is disrupted and the customer suffers inconvenience. The Great Eastern Line of British Railways' Eastern Region is being electrified and Colchester Station remodelled and, to explain what British Railways was doing, an "Open Forum," on the lines of those already organised on the North Eastern Region, was held at Colchester on April 19. Details will be found in our news pages. A meeting of this kind not only gives the railways' customers a chance to obtain an insight into what is being done, and why, but is also a means of introducing railway officers to the public. It is more satisfactory to deal with an individual who has been met face-to-face than to correspond with an impersonal title. Under the chairmanship of Mr. W. G. Thorpe, Line Traffic Manager (Great Eastern), the panel could not fail to be both interesting and stimulating.

Crewe dinner

THE 54th Crewe dinner, referred to elsewhere in this issue, was held at Whitehall Court, London, on April 21. As always, the gathering included many eminent locomotive engineers. Mr. R. F. Hanks, Chairman of the Western Area Board, British Transport Commission, proposed the toast to past

and present Crewe men. With a lifelong affection for the steam locomotive he said that he could not help thinking that had steam been developed a little more it might have been possible for it to have bridged the gap until electric traction became available. He nevertheless acknowledged the excellence of the diesel for shunting. Finally he paid a tribute to those of the same generation who had mastered the skills of diesel and electric locomotives and who had helped the railways through a difficult period. Mr. R. F. W. Eardley, responding for past Crewe men, spoke of the changed times but assured those present that so far as personnel were concerned those coming along were as good as ever. Mr. J. E. Craik, speaking for present Crewe men, referred to the big changes with their far-reaching effects. They were justly proud of the tradition in which they followed.

Railway students' annual dinner

THE annual dinner of the Railway Students' Association last week took place at the London School of Economics & Political Science and was attended by some 80 members and guests. The reception by the President, Mr. J. R. Hammond, who is General Manager of the Western Region of British Railways, was held in the Senior Common Room; the dinner in the Staff Dining Room, and the dance which followed in the Refectory. The surroundings and the renewals of association with London University added much to the pleasure of the evening to both members and guests. Mr. J. R. Hammond was in the chair, and he was supported by Sir Reginald Wilson, Mr. H. E. Osborn, Mr. S. E. Bellamy, and Mr. G. J. Ponsonby. The lively enthusiasm which this Association retains is due, in large part, to the excellent work which is done by its committee, of which Mr. S. E. Bellamy, the Chairman of Committee, and Mr. E. R. Woollatt, the Hon. General Secretary, are two particularly praiseworthy examples.

British Standard for railway capacitors

IN THE past, each British Railways region has drawn up its own specification when ordering capacitors for signalling track circuits. A new British Standard (B.S. 3347 : 1961—capacitors for railway signalling track circuits) has been prepared at the request of the British Transport Commission to meet the need for one recognised standard for capacitors. It is a small, but important, contribution to the increased efficiency of British Railways. The specification applies to fixed and adjustable capacitors for use on electrified or non-electrified railways as current limiting and phasing impedances in signalling track circuits. It lays down requirements to ensure that the capacitors give reliable service in the arduous conditions to which they are subjected. Capacitance values and overall dimensions are specified together with performance tests. Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 4s. each. Postage will be charged extra to non-subscribers.

Beyer, Peacock & Co. Ltd.

THE report of Beyer, Peacock & Co. Ltd. and its subsidiaries for the year to December 31, 1960, shows a combined profit, before tax, of £321,864 which compares with £72,090 for the previous year. With the consolidated balance brought forward from 1959, the total is £957,976 against £919,119. The profit taken up by the company after tax is £139,266 which compares with £142,048, and the combined profit of the group after tax attributable to the members of Beyer, Peacock & Co. Ltd. is £172,234 against £5,756. Experience in 1960 of the working of the holding-company structure which was instituted in 1959 has afforded evidence that the changes are working well, and that the organisation of the group as a whole has brought improvements in operations and given indications of useful

further development. The first of a series of 95 main-line diesel hydraulic locomotives ordered by the British Transport Commission and built at Gorton Works successfully underwent trials approximately three months ahead of schedule. The reorganisation at Gorton has been completed and production facilities from being wholly steam are now predominantly devoted to diesel traction.

European timetable conference

THE European goods-train timetable conference was held in London from April 12-19. The international freight services, to which the British ferry services operated from Harwich and Dover make an important contribution, are operated in a highly-efficient manner. This smooth working is largely due to the excellent co-operation between the delegates to the Livret-Indicateur International Marchandises (L.I.M.) gatherings. Mr. H. C. Johnson, General Manager of the Eastern Region, British Railways, speaking at a dinner given to the delegates at the closing of the conference, on behalf of the British Transport Commission expressed pleasure in welcoming the delegates. He pointed out that railways are vital to the economic well-being of a country, and said that L.I.M., and its President, Dr. Matula, were responsible for important developments in this connection.

Khandwa-Hingoli construction features

THE construction of the new line from Khandwa to Hingoli has been briefly described from time to time in our columns, but some further details may now be added. The 24-mile Melghat section through the Satpura Range entailed much heavy construction work, the most spectacular feature being a complete spiral loop. To "make length" in order to secure a reasonable gradient, the line crosses itself on a high viaduct consisting of 17 spans each of 40-ft. girders. The earthworks on the intervening spiral loop and on both sides of this viaduct include high embankments and deep rock cuttings. On the 188-mile link there are five viaducts over 70 ft. high, and the two largest bridges are over the Purna River (seven spans of 150 ft.) and the Tapti (six spans of 150 ft. and one of 80 ft.). Two tunnels with a combined length of 2,868 ft. were bored through rock with difficult strata.

A link of national importance

THE hitherto completely separate 10,372-mile metre-gauge system in northern India and the 4,933-mile system of that gauge in south India were connected officially on January 2, when the Railway Minister opened the 188-mile link between them, the Khandwa-Hingoli railway. Its completion enables traffic from far north-eastern Assam, and from Bhatinda and Ramnagar in the north-west to the southern tip of the Peninsula to be carried throughout by metre-gauge with no transshipment. The former breaks of gauge, costly in operation and in losses due to pilferage, not to mention inconvenience for passengers, are important eliminations. Another great advantage secured by the construction of this link is the uninterrupted flow of metre-gauge rolling stock throughout the whole country. Previously it had to be transported on 5 ft. 6 in. gauge wagons over considerable distances to pass from the northern to the southern metre-gauge system and vice versa; there was no other means of adjusting the stock between the systems.

Indian Railways during 1959-60

ADVANCE information shows that once more Indian Railways had a most successful year ended March 31, 1960. There were increases as compared with the previous year of 6.50 and 6.63 per cent in passengers and goods originating respectively, and 9 and 7.23 per cent in passenger- and ton-miles. The operating ratio was reduced by 3.2 per cent, there being

an increase in working expenses due to a rise in the price of and deterioration in the quality of coal, as well as the greater quantity used to haul the increased traffic. In aggregate, 165 miles of new lines were completed and opened for traffic and 750 miles were under construction or sanctioned during the year. There was an improvement in the total number of accidents of 1.2 per cent and there were no major accidents.

Comment on the Select Committee's findings

SOMEWHAT belatedly, and particularly so in the face of the impending dissolution of the British Transport Commission, a White Paper has been issued containing the comments of the Commission and of the Ministry of Transport on the confidential report made by the Select Committee on Nationalised Industries. That report was not published and its contents were filtered to the public only through the medium of a White Paper based on its findings. The Commission has confined its expressed views to Part II of the report—it has not commented on Part I or on the Minutes of Evidence. The new White Paper, therefore, should not be construed as containing an exhaustive statement of the Commission's views.

The main point to emerge from the statements of both Commission and Ministry is that both sides object to a Government subsidy for publicly-demanded but unremunerative services. After that, there are divergencies of opinion. The Minister states that he is still considering the idea of such a subsidy, though he makes it clear that "the Government must reserve its view." The Commission is more outright in its opposition: it points out that it would be very difficult first to identify and delimit the unremunerative services concerned (i.e., in defining what constitutes the service in each particular case), and then in computing the loss. Where a branch line is threatened with closure there may be no problem of definition, but the gross receipts of services arise partly from local traffic and partly from through traffic. The loss often would not be confined to the local section of the journey, and contributory or feeder values would have to be considered. In defining costs of a particular service, four main alternative bases of estimation exist. These are: the immediate savings if the service is discontinued; the long-term savings; the full allocated costs, exclusive of track and signalling, and the full allocated costs including an estimate of track and signalling costs. While the Commission sees the merits of the proposal, it emphasises the technical difficulties involved and does not want the creation of a rule that every piece of the service which might, perhaps temporarily, be unremunerative must be closed unless it receives a Government subsidy. It does not think that the proposal would solve all the financial troubles of the railways.

On the committee's recommendations on modernisation schemes, the Commission submits that a competitive business needs reasonable freedom to move with flexibility. It complains that the Government's recent decision that projects costing more than £250,000 must be put before the Minister for examination "involves the consideration of relatively small projects successively by area board, Commission and Ministry, and the Commission has already represented that this limit should be substantially raised." The Ministerial view is that changes in the financial prospects of the railways brings about an increasing need for close and detailed governmental examination of capital projects. The original establishment of £250,000 as the maximum cost of an individual scheme which does not require ministerial examination by itself would not suffice to secure the closer supervision of the large capital expenditure recommended by the committee in 1958. The procedure is therefore being supplemented by the preparation and examination of investment programmes covering the Commission's plans over four years. In this connection, it is interesting to note that the Commission itself asks for a similar examination of schemes to be made, but that it favours a five- and not a four-year period for such examination.

The Minister accepts the views of the committee that the statutory restrictions on property development by the railways should be lifted so that the Commission can make the utmost use of its property assets. The Commission, on its side, states that an easing of restrictions would enable it to turn its property to good account, but adds that "there will be many cases when it is more to our advantage to participate in the development of our own property than to dispose of it outright." It is obvious from the Minister's statements that he intends his words to apply both to the British Transport Commission and to the new organisation which the Government proposes to set up in the Commission's place.

French summer train services

FURTHER accelerations figure in the 1961-62 timetables of the French National Railways, which come into force on May 28. Some of the most notable result from the extension westward of electrification along the Eastern Region main line from Nancy to Châlons-sur-Marne. Between Paris and Strasbourg six expresses in each direction will be accelerated by an average of 35 min. each. Of the two first class extra-fare trains, the 8 a.m. from Paris, calling intermediately at Bar-le-Duc only, will reach Nancy, 219 miles, in 3 hr. 24 min., and Strasbourg, 312 miles, in 4 hr. 43 min.; the 6.50 p.m. ("L'Européen") will take 3 hr. 29 min. and 4 hr. 52 min. respectively. Westbound, the 7.44 a.m. from Strasbourg will run to Paris in 4 hr. 42 min., and 6.52 p.m. ("L'Européen") in 4 hr. 53 min.; all four are speeded up by 28 min.

The most outstanding acceleration will be that of the eastbound "Orient Express"; this train will leave Paris at 9.15 instead of 8.25 p.m., but be in Strasbourg by 2.49 a.m., 3 min. later, and a total acceleration of 1 hr. 40 min. will bring the train into Vienna at 2.50 instead of 4.30 p.m. Declining patronage has resulted in the withdrawal of the through sleeping car for Budapest and Bucharest. The 8 a.m. from Paris will include a through coach for Munich, arriving at 5.54 p.m. (34 min. earlier than the previous connection) and, in the reverse direction, this coach will start from Salzburg at 11.15 a.m. and leave Munich at 1.5 p.m., being attached at Strasbourg to "L'Européen" and reaching Paris at 11.45 p.m. Completion of other electrification in the Nancy area will permit accelerations ranging from 11 to 47 min. in the service between Metz, Nancy, Dijon, and Lyons.

As a result of the Italian change-over from three-phase 3,700-V. current to 3,000-V. d.c. between Modane, Turin, and Genoa, trains between Paris and Genoa by this route will be faster, and there will be accelerations between Paris and Modane. The principal day train, at 8.20 a.m. from Paris Lyon, will reach Genoa at 9.58 instead of 10.37 a.m., and the corresponding return train, at 7.47 instead of 6.58 a.m. from Genoa, will be in Paris by 9.45 p.m. as now.

On the South Eastern Region main line, the principal innovation is an express from Paris Lyon at 7.45 a.m., which will serve as a relief to the heavy 9.15 a.m. Down; the former will reach Dijon (195.3 miles) at 10.28 a.m.; Lyons (317.4 miles) at 12.18 p.m.; Marseilles (535.4 miles) at 4.15 p.m.; and Nice (674.7 miles) at 8.10 p.m., calling also at Valence and Avignon and all principal stations between Toulon and Nice. The return working will be at 11.15 a.m. from Nice, 2.44 p.m. from Marseilles, 6.51 p.m. from Lyons and 8.39 p.m. from Dijon, reaching Paris at 11.33 p.m. This train will be passed at Lyons by the northbound "Mistral," which it will relieve of some of the latter's connections. The new service will run until September 30 only; during its currency the 4 hr. 5 min. Paris-Lyons express "L'Aquilon" will be suspended. The latter at present leaves Paris at 7.25 p.m., and Lyons at 8.5 a.m., but on its resumption the start from Lyons will be at 7.25 p.m., as a relief to the northbound 6.48 p.m. "Mistral."

The other important introduction over this main line will be of the Swiss "T.E.E." train "Cisalpin," which is to start running on July 1 and for the first time will give an 8-hr. day

service between Paris and Milan. Eastbound, it will follow 5 min. behind the "Mistral" from Paris Lyon at 1.15 p.m. and cover the 195.3 miles to Dijon in 144 min. (81.4 m.p.h.). From there to Milan, it will call only at Vallorbe, Lausanne, Brigue, and Domodossola; by connections from Lausanne it will be possible to reach Geneva at 7.11 and Berne by 7.26 p.m. In the reverse direction, the "Cisalpin" will start from Milan at 2.55 p.m., and a connection from Geneva at 5.9 p.m. will reach Lausanne in time for the "T.E.E." departure at 6.11 p.m. The extremely narrow headway to which the French are prepared to work their high-speed trains is seen in the fact that the "Cisalpin" will be booked to leave Dijon 3 min. behind the "Mistral" and reach Paris Lyon 4 min. behind, at 10.55 p.m., on a run booked at 78.7 m.p.h.

Another substantial acceleration will be that of the "Iberia Express," the principal night service from Paris to Spain via Irun. From the Austerlitz station this will follow instead of precede the "Pyrenees Express," starting at 10.40 instead of 9.35 p.m.; Bordeaux will be reached at 4.17 instead of 3.21 a.m., and Hendaye (504.4 miles) at 7.53 instead of 7.25 a.m., a total acceleration of 37 min. Among new trains will be an express from Amiens to Paris at 8.2 a.m., taking 78 min. for the 81.3 miles including a stop at Creil; the return working will be at 6.18 p.m. from Paris Nord, reaching Amiens at 7.36 p.m.

The increasing popularity of the "auto-couche" trains is seen in further extensions of this service for the night transport of passengers and their cars. There will be additional trains of this type three times weekly in each direction between Paris and Biarritz, and twice weekly between Paris and Milan. The service once weekly last summer between Amsterdam, Liège, and Avignon this summer will be twice each week between Liège and Avignon, alternatively from Amsterdam and Düsseldorf. All these trains will include sleeping cars for both classes of passengers as well as second class couchettes and restaurant or light refreshment service.

The Nigerian Railway in 1959-60

IN his final report before retirement as Chairman of the Nigerian Railway Corporation, Sir Ralf Emerson records that in the year ended March 31, 1960, operating revenue fell to £13,768,000, a decline of almost £2 million from the record 1958/59 earnings of £15,755,000. For the first time there was a deficit in operating account, to the extent of £294,000, and after including interest payable on capital the net loss for the year reached £1,350,000. Against this there existed reserves of approximately £3 million.

Sir Ralf lists three main reasons for the rapid reversal of fortune in 1959/60:—

1. The Federal Government salaries and wages award, costing £700,000 in 1959/60, and which was only partly offset by operating economies of £400,000. In a full year the higher payments will call for £1.1 million.

2. Groundnut and cotton crops were substantially lower. But the main impact of this reduction will fall in 1960/61.

3. Intensification of road transport competition, which continues to present problems "of the first magnitude." The Stanford Research Institute, of California, has in hand a specialist study of basic transport costs by road, rail, river, and sea in Nigeria, and will project capital and current costs through to 1972.

Following the storm of criticism raised in the immediate post-war decade that the railways were inadequately equipped to carry the expanding crops, the system has been considerably developed. But the result was that at March 31, 1960, equipment worth more than £2 million was idle, and Sir Ralf underlines the fact that the railway is now equipped to carry much higher tonnages than it is handling. Freight revenue decreased by over £2 million in 1959/60, made up of £912,000 reduced rates designed to limit the loss to road competition, and £1,127,000 caused primarily by reduced commodity tonnages.

The following are some of the principal results for 1959/60, compared with the previous year:—

	1958-59 Thousands	1959-60 Thousands
Passenger journeys	7,015	7,881
Tonnage hauled (paying)	2,353	2,058
Passenger train-miles	660	714
Mixed train-miles	1,249	1,252
Goods train-miles	5,506	5,080
Departmental train-miles	155	146
Passenger parcels & mails receipts	£ 1,889	£ 1,854
Goods and livestock receipts	13,538	11,545
Road transport receipts	105	91
Total working receipts	15,755	13,769
Working expenditure	13,724	14,062
Net working receipts	2,031	*293

* Deficit

The average charge for carrying one ton of goods one mile is, in several cases, less now than it was 30 years ago. The major increases have been levied on petrol, groundnuts, cotton lint, and tin. The average revenue per ton mile in 1930 was 2.02d., and in 1939 a value of 1.71d. was recorded. The average rate per ton mile in 1959/60 was 23.76 per cent more than in 1930, and 46.20 per cent greater than 1939, not a significant increase in relation to the 300 per cent to 400 per cent jump in staff, material, and fuel costs.

The rate reductions resulted in an improvement in the amount of imported traffic carried, but the average revenue per ton of goods carried fell to £7.1 in 1959/60 against £8.8 in 1958/59. Exports declined in terms of revenue by £1,308,000 as a result of lower rates and reduced shipments. Kola nuts traffic was largely retrieved from road transit as a result of cheaper rates, while cattle traffic continued its strong upward trend so marked in recent years. Total tonnage of freight moved was 2,803,000 tons, of which 2,058,000 was revenue producing, compared with 3,096,000 and 2,342,000 tons respectively a year earlier. Gross freight receipts dropped to £11,545,148 against £13,537,870.

Since the general application of the reduced basic passenger fare of 0.65d. per mile on all local trains, there has been a recovery in numbers carried to a peak of just under 8 million in 1959/60, nearly 1 million more than a year earlier. But there has not been a corresponding recovery in revenue, which was 5.7 per cent lower at £1,451,277.

Expenditure on revenue account amounted to £14,063,000, a rise of £338,000. The total included £680,000 more for salaries and wages—an event outside railway control. Apart from this, expenditure was lower.

The original capital expenditure estimate for 1959/60-1963/64 was £40 million, of which £23.4 million was to be met from internal resources. But intensified road competition—inevitably a part of the pattern of future operations—and higher salaries and wages mean that in the first two of the five years there will be substantial losses instead of profits. Because of this, the amount the railway itself can provide will be correspondingly reduced. The development programme has accordingly been reduced to the barest essentials, and total authorisations at the end of the year were £22.1 million, including £15.9 million for the Bornu extension.

Total engine miles for all services showed a significant rise for diesel-operated traffic, up from 11 per cent to 27 per cent. Dieselisation of the main line between Kano and Offa (485 miles) and of the Kaura Namoda branch was completed. Locomotive stock at the end of the year was 215 steam and 35 diesel engines, plus 55 steam and four diesel shunting locomotives, two diesel railcar sets and two steam railcar sets. Main-line coaching stock consisted of 547 coaches and 5,489 wagons. During the year 211 covered wagons of 35 and 25 tons capacity, 289 open bogie wagons and 22 goods brake vans went into service, and 28 more tank wagons were put on rail by the oil companies.

On the permanent way mechanical tamping has been introduced, and two lightweight ballast tampers are in use. Double wire signalling has been brought into use at 16 wayside stations, with a further five completed ready for use and work on nine others in progress.

“Main line thru Rockies: Rio Grande”

BY A CORRESPONDENT

THE heading of this article repeats the well-known slogan of the Denver & Rio Grande Western Railroad, which operates 2,128 miles of road at high altitudes in the states of Colorado and Utah. For these latter days, its 1960 report is a cheerful document. Revenues of \$76 million were up 1.2 per cent, while expenses were only 0.01 per cent. higher. The operating ratio of 66.2 per cent compared with 78 per cent for Western District Railroads and with 79.5 per cent for the whole U.S.A. railway system. Wagon loadings in 1960 were 5,380, or 1.25 per cent, higher than in 1959, and passenger ticket sales were up 2 per cent.

The report describes these results as “not unfavourable.” They are remarkable for a railway whose main line, starting from Denver, a mile above sea level, climbs for 50 miles to a height of 9,240 ft. at the six-mile long Moffat Tunnel and then, over 25 miles, drops by 1,300 ft. to Granby. For the next 235 miles the track runs parallel with the picturesque Colorado River until it enters Utah at a height of 4,320 ft. A westbound train then faces a steep rise for about 160 miles to Soldier Summit, a 7,440-ft. peak of the Wasatch Range, and finally coasts down a slope of about the same distance to Salt Lake City, 1,000 ft. below the level of Denver and the Rio Grande's western terminus.

The railway's 1960 report has a clear picture of a westbound freight train traversing the countryside near Granby. A diesel locomotive of four units heads the train, which might, according to average statistics, consist of 67 wagons holding a net load of 1,618 tons and moving at over 20 m.p.h., so that it would help to produce a record volume of 70,056 gross ton-miles per train-hr. For 1948 these averages were a load of 1,091 tons, a speed of 16.5 m.p.h., and an hourly output of 37,850 gross ton-miles. Over 13 years the Rio Grande raised the output of freight train working by 85 per cent and saved more than a quarter of the freight train-miles worked in 1948.

The general statistics cover the Royal Gorge route between Denver and Glenwood Springs on the main line. From the State capital its rails carry south for 75 miles to Colorado Springs, situated 700 ft. higher, but fall to a height of 4,670 ft. at the expanding city of Pueblo. There, the line swings round and ascends in a northwest direction to Royal Gorge, where at a height of 5,500 ft. the view of two bridges across the canyon appeals to many passengers. Railwaymen will be more interested to know that, in the short distance of 115 miles, the permanent way rises by 4,740 ft., and crosses the Continental Divide at Tennessee Pass, 10,220 ft. above sea level, and the highest point on any main-line standard-gauge railway in the United States.

The Rio Grande has ensured the efficient operation of long freight trains by an expenditure of about \$40 million on road and equipment since 1948. Last year, additions and betterments cost about \$5 million, the bulk of the money being spent on equipment. The locomotive stock of 254 diesel-electric units, must constantly work at high pressure, even if movements on steep gradients are eased by recent extensions of centralised traffic control; an example is the single-dispatcher control over the 234 miles between Salina, near Royal Gorge, and Grand Junction on the main line about half-way between Denver and Salt Lake City.

Bent on keeping up to date, the Rio Grande is testing an electronic communication network, based on microwave transmission facilities. As a bridge carrier between connecting roads, the railway hopes to devise a system which will enable it to advise traders promptly about the progress of their traffic. In 1960, the American journal, *Modern Railroads* presented a trophy to the Rio Grande for its “most effective promotion of railroad freight traffic.” The award seems to have been deserved.

LETTERS TO THE EDITOR

THE EDITOR IS NOT RESPONSIBLE FOR THE OPINIONS OF CORRESPONDENTS

UNFAIR TO BRITISH RAILWAYS

April 14

SIR, May I refer to the letter from Mr. Gregg which was published in your March 31 issue under the heading "Unfair to British Railways."

The point in question is the third section on basis of user taxes, based on net freight ton-miles and passenger-miles, and I would like to know if any literature has been published which gives this compilation, and its relation to their fair share of the expenses of construction and maintenance.

I know, of course, of General Mance's book, and of the controversy concerning "track costs," but so far as I am aware there have never been any quoted figures in relation to these costs by road transport. There is no doubt of the truth of the argument, but I should like to see it borne out in statistical form.

Yours faithfully,

ALFRED SAPSFORD

49, St. Albans Road,
Seven Kings, Essex

TRANSPORT USERS' CONSULTATIVE COMMITTEE

April 18

SIR, Mr. Clinker's suggestion that the functions of the Transport Users' Consultative Committees relating to the proposed withdrawal of train services should be abolished is misconceived. It would be utterly illogical for these committees, appointed under statute for the express purpose of making recommendations upon the representations of users, to be denied the right to deal with the very matters which are the most frequent subjects of such representations. It would be yet another step towards the submergence of the consumer, who is steadily being deprived of any voice in the conduct of enterprises which exist solely for his service, and it would undermine the confidence of the public in the Consultative Committees.

Mr. Clinker's argument, moreover, is based upon false premises. The railways are not required, either by the B.T.C. or the Government, to operate as a commercial undertaking to the complete exclusion of the public need. Indeed, the Transport Acts, 1947, and 1953, impose upon the Commission the duty to have due regard for such need, and paragraph 50 of the White Paper on the Reorganisation of National Transport Undertakings envisages the subsidisation of uneconomic services required in the national interest or to meet social needs. The theory that the withdrawal of services is of any real avail in reducing the railway's deficit has long since been exploded. The report of the Central Transport Consultative Committee for 1960 points out that the total savings effected by all the closures of lines and stations since 1948 amount to a mere £4½ million per annum, and it is clear, therefore, that the sole method by which the railways can be made to pay is by modernising them as quickly and completely as possible, and by doing everything possible to attract traffic to them. If this result is achieved to the extent expected, the railways will be able to operate a great many "uneconomic" services and still achieve an overall profit. In general, therefore, further withdrawals at present are premature. No one can cavil at a withdrawal to which there is no public opposition; but what can be said, for instance, of "nearly a hundred of the smaller class of contentious cases, the average saving being about £5,000 per annum"? They involve, say the Central Committee, "to a varying degree, inconvenience or even hardship to the public. They give rise to most of the

criticism which is voiced from time to time in Parliament and in the Press. It is interesting to see what a relatively insignificant contribution they make to the total financial problem." In most cases, withdrawals cost far more in damage to railwaymen's morale and in loss of public goodwill than is saved in "economies." It is true that these factors are not evaluated in railway accounts, but one recalls the dictum of the Chancery judge who said, "Accountants are the witch-doctors of the modern world, and they, too, often deal in unrealities!" Why should not the public be allowed to challenge their figures, which have not always been proof against close investigation and cannot be invested with the infallibility of Holy Writ? Is it not somewhat presumptuous to dub as "amateur busybodies" those users who dare to complain because they would suffer inconvenience, expense, and even hardship by the withdrawal of services which were provided for them and upon which they have been induced to rely?

Even if, eventually, the modernisation plan does not succeed in making the railways pay, why should they not receive a public subsidy? Hundreds of millions of pounds are spent annually out of rates and taxes upon the road transport system without any hope of financial return, and there is every prospect that rural bus services will be subsidised.

Yours faithfully,

B. D. J. WALSH

The Railway Club,
320, High Holborn, W.C.1

AIR COMPETITION WITH THE RAILWAYS

April 11

SIR, In commenting on the serious threat to British Railways arising from the new British European Airways service between London and Scotland and the fares charged, you state in your issue of April 7: "The policy of the railway companies before the war, in participating in air travel, was right and should have been continued."

If you are suggesting that British Railways should take an active interest in internal air transport, surely this is not the solution to the problem today. British Railways, like B.E.A., are a nationalised undertaking. What merit is there in one nationalised undertaking poaching on the preserves of another, thus duplicating effort and increasing wasteful competition?

If it is accepted, as surely it must be, that the railways even in an attenuated form are essential to the life of the community, and if it is the Minister of Transport's intention that they should be made to pay their way, the Minister should take steps to see that the railways are protected where they can give an efficient service. In this case, protection should take the form not of interfering with the air service which meets a demand for fast travel, but of regulating the fares. After all, it is not unreasonable that the passenger, for whom time means money, should pay something extra for the superior service which he is getting.

It would be interesting to know to what extent the B.E.A. fares would have to be increased if the airport interest and operating charges were borne in full by the air lines, as they should be, instead of being subsidised by the taxpayer. At present, it seems that one nationalised undertaking is being subsidised to compete with another. Is this sound economics or even common sense?

Yours faithfully,

F. C. C. STANLEY

"Tellisford," Slade Oak Lane,
Gerrards Cross, Buckinghamshire

The Scrap Heap

All change

Rooms at the old Wisbech North railway station, Cambs., may be used by schoolboys for changing accommodation. The governors of Wisbech Grammar School have approached British Railways about it, as accommodation is needed for the Harecroft Road playing field.

Intensive excursion working

The final tie, as the cup final was then termed, held at the Crystal Palace on April 19, 1913, produced some intensive working of excursion trains. No less than 44 return trains left Euston on the Saturday / Sunday night. From 12.10 a.m. until 3.30 a.m. departures were booked at intervals of almost five minutes, 32 trains leaving during that period.

"Bradshaw" A and Ω

On Monday next, the last issue of *Bradshaw's British Railways Guide* will be published, bearing the serial number 1521. This famous publication has appeared regularly since 1839—nearly 122 years. We reproduce the title-page of the first issue designed to show time-tables of the whole country, and also the cover of the last. The first comprehensive issue was dated 10th Mo. 25th 1839, as will be seen. It was preceded by one for the northern railways only, and another for the southern railways—hence number three. George Bradshaw's dislike for the use of month names derived from heathen deities had its repercussions in the dating until 1939. We gave some details of the long and interesting history of *Bradshaw* in our issue of March 17, when discontinuance was announced.

Pre-Brehner !

One of the curiosities of the "Tube" is the dearth of advertisements at the stations and platforms, yet one would imagine that advertisement agents must be longing to cover the acres of tempting space which seem almost calling out for covering. Apparently the company does not desire to cover its walls even with the artistic posters of today, and the company believes that the passengers would approve of this policy.—*From "The Financial Times" of April 18, 1901.*

Skittles in the subway

Some of the dullness of the New York underground railways may be dispelled soon—with beer and skittles. The New York transport authorities have signed an agreement with the Subway Bowling

BRADSHAW'S
Railway Time Tables,
AND ASSISTANT TO
RAILWAY TRAVELLING,
WITH
ILLUSTRATIVE MAPS & PLANS.

AUTHOR OF
BRADSHAW'S MAP AND SECTION OF THE
RAILWAYS OF GREAT BRITAIN,
39T. 4IN. BY 3TT. 4IN.

PRICE IN SHEETS . . . 1 11 6
MOUNTED 2 10 0

AND SOLD BY G. BRADSHAW, NEWBURY-STREET,
MANCHESTER;
AND WILD, CHANCING CROSS, LONDON.

PRICE ONE SHILLING.

LONDON:
SHEPHERD AND SUTTON, AND WILD,
CHANCING CROSS.
AND SOLD BY ALL BOOKSELLERS AND
RAILWAY COMPANIES.

10th Mo. 25th, 1869. (No. 3)

[illegible]

The first and last edition of Bradshaw

Company, which allows the company to build and operate a total of 76 bowling alleys in three stations of one of the underground lines. The transport authorities will receive 12 per cent of the gross receipts of the alleys for 20 years. The company has guaranteed £650 (about £230) a year for each alley, or \$850 (about £300) if it is able to obtain a licence to sell beer. The transport authorities have stated optimistically that there is room for 500 more alleys in unused parts of underground stations.

Round in circles

After having been up all night and needing some sleep, a bricklayer and plumber's mate boarded a train at Piccadilly Underground at 6.20 a.m. and each spread himself over four seats on a Circle line train. According to a policeman, they went round and round the Circle for four hours before he finally got them off the train at Kings Cross. The magistrate before whom they later pleaded guilty to trespassing thought they must like trains.

Only for a Doris Day ?

A campaign to inspire gentlemanly courtesy in crowded New York subways seems to have done nothing except set men to raving at women, and women to snarling at men. The pushing, shoving, and battling for seats continues amid heated exchanges, insults, and letters to the editors of newspapers. The "war"

erupted when the transit authority, which operates the subways, put up posters urging the males to "Be a Knight for a Day." They showed a man offering his seat to a damsel. Here are two samples from the chorus of yowling and growling which arose forthwith: "This city has a higher concentration of uncouth female hooligans per square foot of land area than any other city in the world . . ."—and "Most of these women must work because men like you are too lazy to earn enough to support them."—*Condensed from "The Evening Standard," April 13.*

One-track mind

A man was recently found curled up asleep in a railway carriage at Windsor Riverside Station. The train was delayed for 20 minutes because porters could not move him. Later, he was fined 10s. for being drunk. A porter told the Bench that he was looking through the carriages of a train which had just pulled in. "This man was curled up on a seat," he said. "We wanted to clear the train and move it to another platform; but we could not move him. We got him out of the train, but he got straight back in again. He was just stupid."

We'll get over it

The following notice appeared last week at a British Railways London terminus: "We regret that owing to signal failure, trains are now running normally."

OVERSEAS RAILWAY AFFAIRS

FROM OUR CORRESPONDENTS

HUNGARY

Concrete railway sleepers

Claimed to be the most modern in Europe, a factory for producing concrete railway sleepers is stated by the Hungarian press to have made import of sleepers superfluous. Daily output of the factory, which cost £1,170,000 to build at Labatlan in northern Hungary, is 1,150 sleepers—15 per cent higher than was originally planned.

FINLAND

Re-railing

During 1960, 108 track-km. were re-railed: 55 km. were equipped with rails weighing 54 kilos per metre and 11 km. with rails of 43 kilos per metre. About 10 km. of double track were opened for traffic in 1960. Also opened to traffic was a double track on the Hämeenlinna-Kuorila line; the old track was temporarily closed for traffic while maintenance and re-railing were being carried out. This line is to be equipped with rails weighing 54 kilos per metre.

Fuel consumption

The consumption of gas-oil in locomotives and powered coaches has increased to 27.7 million litres (about 10 million litres more than consumption in 1959), and 772,445 cu. metres of firewood has been used as fuel in steam locomotives

last year (about 52,000 cu. metres less than in 1959). Coal consumption reached 318,000 tons. Fuel oil consumption increased from 23,000 to 31,000 kilos, and consumption of gasoline from 189,000 to 287,000 litres. During the year 8,700 tons of peat was also used in steam locomotives.

DENMARK

Danish Railway Society

A recently-formed Danish railway society has begun the first hobby-railway in Denmark. On the short branch-line belonging to the Danish State Railways from Soroe Junction to Soroe (only used for goods traffic) the society will run trains of old materials every Saturday and Sunday during the summer.

NEW SOUTH WALES

Sydney eastern suburban line

Instead of the costly network of lines originally proposed to serve the eastern suburbs of Sydney, a modified single route has been put forward for the early consideration of the N.S.W. State Cabinet. It would run from new platforms beside Central Station to Town Hall and Martin Place, and then pass under the Domain, above Woolloomooloo and onwards via Edgecliff and Woolahra to Bondi Junction. This line would use

tunnels and excavations already existing under the city, taking advantage of the capital sunk in them, but would nevertheless cost about £A.25,000,000.

New bogie livestock wagons

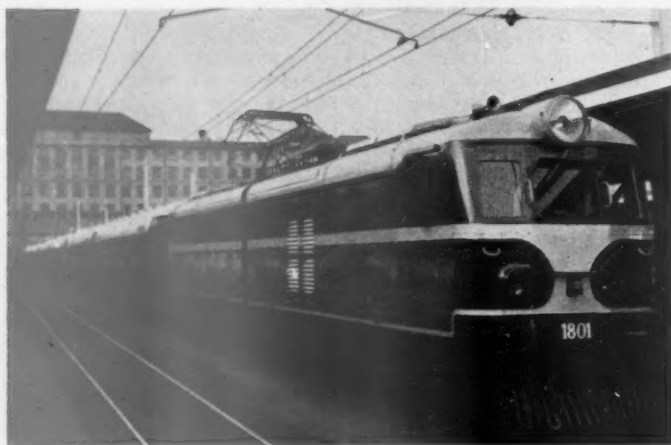
The N.S.W. Government Railways recently acquired 650 livestock wagons of two new types, 550 sheep wagons and 100 cattle wagons. Both types are on similar 37-ft. underframes, but are mounted on different types of 5-ft. 9-in. wheelbase bogies suitable for speeds up to 70 m.p.h. The sheep wagons have British Timken roller bearings and the cattle wagons S.K.F. The whole of the underframes in each case are covered with stainless steel sheeting riveted to the frames with $\frac{3}{16}$ -in. stainless steel rivets. All joints between the two are sealed with a priming compound. The cattle wagons have two compartments each holding 10 head of cattle, and the sheep wagons have two tiers. The designs were approved by the Stock & Station Agents' Association and are reported to be exceedingly popular with consignors.

NEW ZEALAND

New class of railway wagons

Flat-top railway wagons of a new class are being built at the Addington workshops of the New Zealand Railways Department. Designated "N.C.," the wagon will be 22 ft. long over headstocks

"SCENIC DAYLIGHT" EXPRESS



"Scenic Daylight" express, New Zealand Government Railways, left; about to depart from Wellington, and right; leaving Paekakariki where electrification ends and a change of engine is necessary

and weigh 6½ tons. It will carry 15 tons. Designed to carry timber, like the system's "U.B." wagons, the new class will have only four wheels.

Japanese mission

A seven-man railway mission from Japan has been investigating New Zealand's railways. It has conferred with Mr. A. T. Gandell, General Manager of the Department, and has inspected Woburn Workshops.

Level crossings

Because of staff shortages New Zealand Railways has been unable to keep up with its programme for installing alarm systems at level crossings. As soon as technical resources allow, installation of automatic warning alarms will proceed.

AUSTRALIA

Development in Western Australia

The West Australian Railways Minister has stated that future development of the metropolitan area and the railway system make it essential to retain the north-of-the-river rail link between Perth and Fremantle, and that proposals to remove the line had been rejected on practical grounds.

PHILIPPINES

Nueva Ecija-Cagayan Valley extension

Building of the Nueva Ecija-Cagayan Valley extension of the Manila Railroad, in the Philippines, was scheduled to begin on April 15, according to local officials. President Garcia, of the Philippines, was to drive the first spike to signal the beginning of the work.

CAMBODIA

Colombo Plan equipment

The Australian Ambassador to Cambodia, Mr. Francis Stuart, has presented the Cambodian leader, Prince Norodom Sihanouk, with railway equipment worth over £A500,000. The Australian Government has given the equipment under the Colombo Plan.

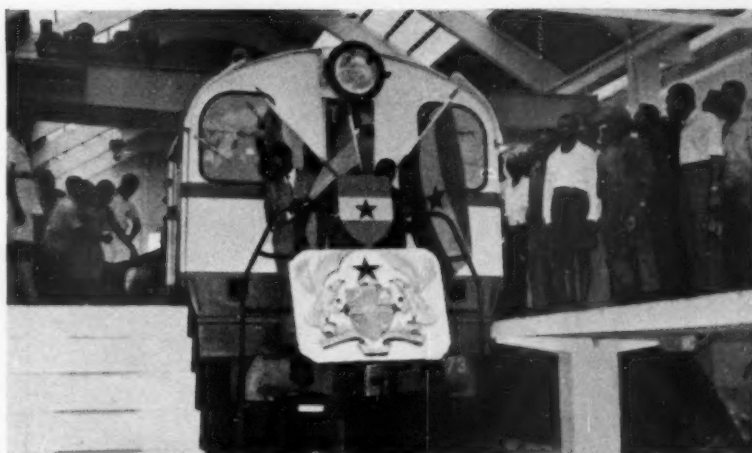
PAKISTAN

\$8½-million railway loan

The United States Government has announced an \$8½-million loan to Pakistan for purchasing railway equipment. In two previous railway loans, the U.S. lent Pakistan \$31.1 million.

Railway centenary

Pakistan Western Railway and Pakistan Eastern Railway—previously known



New workshop at Location, Ghana, photograph shows Mr. Krobo Edusei (right) and Mr. G. K. B. de Graft-Johnson, General Manager, Ghana Railways & Harbours

as the North Western Railway and Eastern Bengal Railway respectively—will celebrate their centenaries in October this year.

ANGOLA

Terrorist attacks

Terrorist attacks have been made at Ucuu, an important railway junction in the Portuguese territory of Angola. The raids are reported to have occurred sometime in the afternoon of April 12. An airforce reconnaissance aircraft flying low over the region saw bodies lying in the open, and wrecked and burning houses.

CONGO

Refugee trains attacked

Tribal tension has risen again in the Kasai region of the Congo and refugee trains are being attacked by Baluba tribesmen armed with bows and arrows. Four people were killed on one train which was attacked three times during a journey from Port Franqui to Lulua-bourg. The Lulua refugees in Port Franqui are being sent by rail to their own people living round Lulua-bourg.

EAST AFRICA

New works programme

At recent meetings of the Transport Advisory Council and its railway and harbours sub-committee, the Council approved expenditure of £3 million on major works and constructions. The principal railway works sanctioned included the final stage of the Tanga line re-laying (£622,000); re-laying 30 miles of the Mwanza branch (£385,000); re-laying of the Konza-Kajiado section of

the Magadi branch (£224,400); railcar services on the Butere line (£130,000); 1961-62 housing (£92,700); Kampala Passenger Station (£45,000); remodelling of Eldoret marshalling yard (£43,000); construction of a crossing station at Sosian; remodelling of Moshi marshalling yard (£26,000), and mobile permanent way maintenance gangs (£44,300).

GHANA

Diesel-electric shop

A new diesel electric shop at Location, Sekondi, on the Ghana Railway, has been completed and is in use. It was opened by the Minister of Transport & Communications, Mr. Krobo Edusei accompanied by Mr. G. K. B. de Graft-Johnson.

Tema Harbour

Over £G-15 million has already been spent on Tema Harbour, which has six berths, and it is expected that full-scale operation will be effective towards the end of this year. Restricted operation has already commenced. Rail access to the harbour and industrial areas is in course of completion.

SOUTH AFRICA

Port Elizabeth Harbour

An order to the value of £721,947 for special ore-loading plant has been placed by South African Railways in respect of Port Elizabeth. The successful contractor is Robins Conveyors S.A. (Pty.) Limited, Johannesburg. The new plant is expected to be in working order toward the middle of 1963. A quay is being built to provide a depth of water at low tide of 40 ft. and the loaders will be large enough to load ore into 45,000-ton ore-carriers.

SERVICING DIESEL FUEL INJECTION EQUIPMENT at Swindon Locomotive Works

THE servicing and overhaul of a wide range of diesel engines is now in operation at the Swindon Locomotive Works of British Railways. An important section of this work is that of fuel-injection equipment servicing. The present flow of work through the department dealing with this is about 22 block-type injection pumps and 350-400 injectors per week. These quantities are progressively increasing as the diesel fleet expands. Servicing is carried out in a section of an existing building which has been converted and fitted out with a comprehensive range of specialised tools and test equipment.

Accommodation of department

The department is divided into a reception area for preliminary stripping and cleaning, a repair section, fuel-pump test room, and a room for the servicing and testing of the Maybach-L'Orange combined fuel pump and injector.

The cleaning bay, adjacent to the pump room, is equipped with four rectangular tanks, in each of which is immersed the wire basket of components stripped from the pump. Oil and sludge is removed in the first tank containing a proprietary solvent, followed by a wash in running water. The basket is then immersed in a de-watering oil followed by a paraffin wash.

The repair section is arranged for block pump servicing in one half and injector

Facilities and procedure in use on the Western Region, British Railways



Layout of equipment for injector servicing

servicing in the other. At each work station in the pump section is a universal pump clamp on which, after bolting down, the pump may be swivelled and clamped in any required position. All springs and wearing parts of the pump

and governor are thoroughly inspected and the unit reconditioned in accordance with the makers' repair standards.

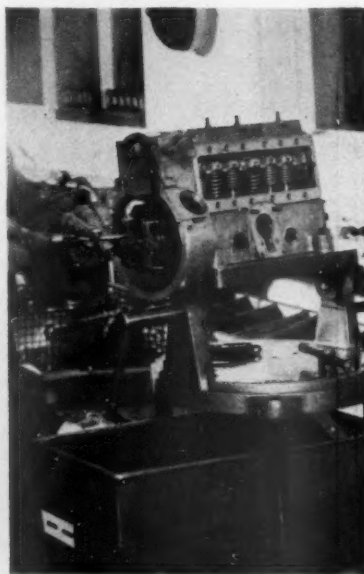
For injector servicing each station is equipped with a C.A.V. hand-pump test set and a motorised needle lapping unit. Secured to the bench are special tools and fixtures to facilitate the dismantling and assembly of the various types of injectors in service in shunters, railcars, and main-line diesel locomotives. A fuel-vapour extraction tundish at each working position discharges into an extraction duct installed below the bench. Injectors are cleaned in Hartridge flushing cabinets on which cartridge filters, to eliminate the re-circulation of foreign matter, have been incorporated. The compressed air used for cleaning is also filtered and dried.

Equipment

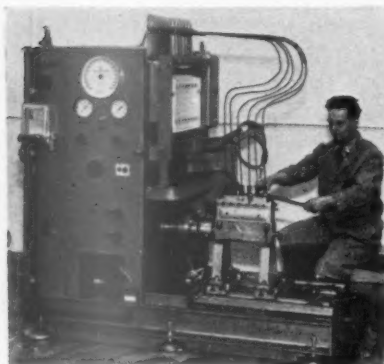
Needle-valve seatings are re-cut on Hartridge or Merlin grinding machines, and a bench microscope is used for inspection. A useful piece of equipment for the inside inspection of nozzles and nozzle holders is a probe illuminator. This is battery-powered to illuminate the small inspection mirror which is viewed through a magnifier. The spray pattern of nozzles under slow-running conditions is checked on a variable-speed motorised pump unit.



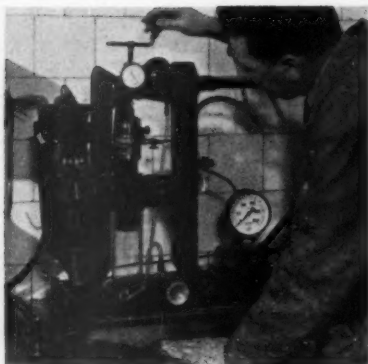
Universal swivel clamp for dismantling and assembly of injection pumps



Noise resulting from fuel pump testing is confined to one room



(Left) Hartridge machine used for calibration and testing of large fuel pumps. (Right): dual-purpose rig for leakage and spray-pattern testing of L'Orange injectors



Working conditions in the injection equipment servicing department are of the high standard required for this precision work. High-intensity fluorescent lighting is supplemented by individual bench lights. Heating is by steam pipes along the walls and ventilation is by Vent-Axia extractor fans. The floor and bench tops are linoleum covered and a comfortable seat is provided at each work station. Noise is reduced to a minimum by the installation of the pump-testing machines in a separate room. In this room head-sets fitted with ear-pads are used by the operators.

Hartridge machines

The Hartridge machines installed are types S.W.E., N.U.E., and H.D.4. These cover all types of single element and block pumps up to 12 mm. dia. Electronic phasing is used and routine testing covers the setting of plunger head

clearances, phasing, and calibrating. Pump delivery and injection pressure are checked on light-load, half-load, and full-load settings.

Governors are adjusted and checked for correct operation at idling and maximum speeds, and fuel feed pumps are checked for pressure and delivery.

L'Orange unit injectors

L'Orange unit injectors are fitted on Maybach engines. This is a combined pump and injector unit, operated from the engine inlet camshaft through a rocker arm. The testing of this injector is carried out on a special rig designed and supplied by the manufacturer of the pump.

The injector is fitted in a motorised head and the fuel discharged through a single-hole nozzle into a glass cylinder filled with steel balls. These remove air from the nozzle spray and the oil drains into a measuring cylinder. Measurements are

taken at 300 and 800 r.p.m., with an automatic tripping at 1,000 shots.

Testing injection equipment

Before the delivery check the injector is tested for internal gasket leakage and for spray pattern. These checks are carried out on a dual-purpose rig, equipped with a hand pump set. Servicing of the pump elements and the nozzles

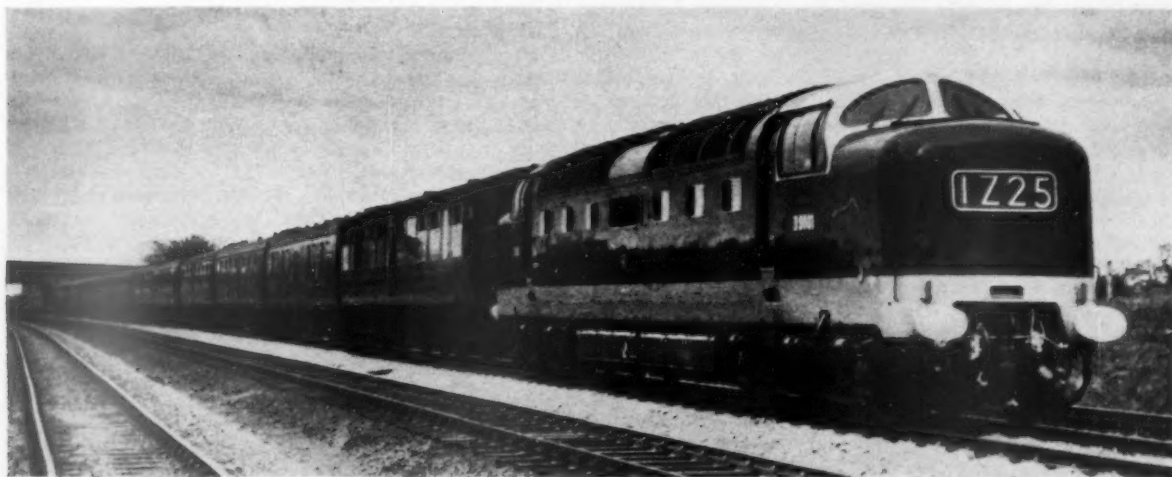


Test rig for calibration of L'Orange combined pump and injector used on Maybach engines

follows the normal procedure used for standard-type equipment.

Before the conversion of the present service department all injection equipment overhaul was carried out in the room now used for Maybach injector servicing.

"DELTIC" DIESEL ON TRIAL



(Photo)

(E. Sanderson)

No. D. 9001 "Deltic" diesel locomotive at speed 15 miles out of York on trial run from Kings Cross to Edinburgh during March 21-22



Exterior of Weaver Junction signalbox

Re-signalling of the Crewe-Liverpool section London Midland Region of British Railways

THE electrification of the Crewe-Liverpool section of the London Midland Region of British Railways is being accompanied by the complete re-signalling of those lines.

To date, work has been carried out on four stages. These extend from Edge Hill (exclusive) through Speke Junction, Runcorn, and Weaver Junction to Verdins Sidings just north of Winsford and nine miles north of Crewe. These stages also included the transposition of the running lines from Liverpool Lime Street to Edge Hill. The remaining stages, to be completed this year, include the final section to Crewe, a new power panel-type signalbox at Edge Hill, and the immunisation of the existing power signalling at Lime Street.

Automatic train control

Four-aspect colour-light signals and continuous track-circuiting are being introduced throughout the whole area. The first four stages alone comprise 174 colour-light signals, 419 track-circuits, and 47 sets of power-operated points. The B.R. standard automatic warning system of train control is also being installed, with fixed inductors 200 yd. in rear of each colour-light signal.

Block-working is being replaced by box-to-box train descriptors. Most of the track circuits are of the protected d.c. single-rail type, the exception being the Lime Street area, where the existing condenser-fed 50-cycle a.c. track circuits are being converted to 83-1/3 cycles as one of the main methods of immunisation against the new traction current of 25 kV. 50-cycle a.c. It has been

Extensive track remodelling and realignment will permit higher speeds and increase line capacity on an exceptionally busy section

possible to use d.c. track circuits elsewhere, because with the traction system adopted in this territory a return wire is provided throughout and, in consequence, one of the two remaining rails can be used solely for track-circuit purposes. The d.c. track relays are immune from irregular operation by the traction 50-cycle a.c. current.

Stage 4 of the re-signalling, which came into use on March 13 last, extends from south of Halton Junction on the Liverpool line through Weaver Junction to Verdins Sidings. At Weaver Junction the line to Warrington, Preston, and the North diverges, and the re-signalling has been extended up this line to Norton Crossing, the next signalbox. Stage 4 covers an exceptionally busy stretch of line, for southward from Weaver Junction it carries both Liverpool traffic, and that to and from the North. As far as possible it is four-track, but there are two bottlenecks, namely Dutton Viaduct just south of Weaver Junction and Vale Royal Viaduct between Hartford and Verdins Sidings. Over both viaducts there are only two tracks.

Push-button signalling

In many ways, Weaver Junction is the keypoint in the whole area, for it is both the junction for the Liverpool and Warrington lines and also at the north end of the two bottlenecks. Therefore, while all other signalboxes so far brought

into use are of the electro-mechanical type, at Weaver Junction there is a new power signalling installation with a route-setting panel of the push-button type. This is the first of its kind in the London Midland Region.

Throughout the whole area there has been extensive track remodelling and realignment to permit higher speeds and thus increase line capacity.

Increased speeds authorised

Referring to the diagram the realignment on the Up side is such that at the converging junction, speeds of 90 m.p.h. and 70 m.p.h. are now authorised for trains from Warrington and Liverpool respectively. With the original layout, speeds were limited to 50 m.p.h. in each direction. The Up loop line formerly east of the Up Liverpool has been lengthened to hold two trains of 60 wagons each, provided that the second train enters it from the Liverpool direction. It has been re-positioned between the Up Liverpool and Up Warrington lines to serve both. Provided that there is not already a train in this loop, trains are authorised to enter it from both Warrington and Liverpool at 40 m.p.h.

On the Down side, the main junction at points 21 has been re-positioned. In place of former speed restrictions of 60 m.p.h. in the Warrington direction and 50 m.p.h. to Liverpool, a speed of 90

m.p.h. is now authorised for Warrington trains and one of 70 m.p.h. for Liverpool trains. A Down slow line also has been provided. Entry into it at points 25 is permitted at 40 m.p.h.

Long switch rails

This realignment has necessitated the use of abnormally-long switch rails, known as "G" switches, at points 21 and 27. They have needed no less than 24 slide-chairs, and are some 60 ft. in length. For safety and ease of movement, the drive from the point machine is connected to three point stretchers, i.e., at the switch toe and also at 17 ft. 6 in. and 35 ft. along the switch. Again points 21 has two facing-point-locks, one on the main slide of the E.P. mechanism opposite the toe of the switches and the second a combined lock and detector in the centre of the track 17 ft. 6 in. along the switch. The "crossing" was made in one solid piece of special manganese steel, and special "soft spots" were included to enable track-circuit bonds to be attached and so maintain the continuity of the track circuit. These are the first sets of points of this kind to be installed on the London Midland Region. Several others have appeared recently on the Southern Region.

To combine safety and fast running at Acton Bridge, one pair of facing points is fitted with a separate combined lock and detector for each switch rail. Each such fitting is bolted to the outside of the respective stock rail and contains the facing point lock and detector for the

switch rail concerned. This method ensures safety, even if the stock rail moves slightly or the gauge becomes slack. In time, it is likely to become standard practice.

All running signals at Weaver Junction have four aspects, with junction indicators when needed. If the road is set for the Up goods loop or Down slow, the signal does not clear until the train has got on a specified track-circuit in rear. Calling-on subsidiary signals are provided for access to the Up goods loop when it is already occupied. All signals which do not protect points are automatic. On the diagram they are numbered in the "hundreds." The emergency switch to restore an automatic signal to danger is not in the signalbox but on the signal-post itself. It is operated by a special key issued to authorised persons.

Weaver Junction signalbox

Weaver Junction signalbox has been built in two sections—the relay room below, and the operating room above. The upper section is built on stanchions and is separate (except for the intermediate wiring) from the lower section. If it is decided to concentrate the signalling over a larger area at some other point such as Hartford Junction, the operating room could be dismantled and the relay room retained and converted to a remotely controlled satellite interlocking.

The operating panel is extremely compact, being about 3 ft. 8 in. long. It is

set nearly vertically with a shelf in front of it for train notices and other documents. It contains the illuminated diagram, repeater lights for the signals, and control push-buttons. Along its top are the emergency point switches and two ground frame control release switches. These ground-frames operate the two emergency crossovers shown on the diagram. As they would always be manned specially when needed, it was thought uneconomic and unnecessary to power-operate them direct from the panel.

Setting up a route

On the panel there is a push-button opposite each signal. Assume the signalman wants to signal a Down Warrington train. He presses the button opposite Signal 17. This at once glows intermittently and the last white route-light on the section controlled by Signal 17 lights up, to show this portion of the route is available. The signalman then presses the button at Signal 16. All the white route-lights from Signal 17 to Signal 16 light up, the intermittent glow on the Button 17 becomes a steady glow, and Signal 17 clears.

The signalman then presses Signal 16 button again, this time to send the train forward. This button now glows intermittently and, if both Down slow and Down fast lines are clear, the final route-lights by Signals 9 and 10 light up, showing both routes are available. He then selects his route and presses the button by Signal 9 or 10 accordingly. The

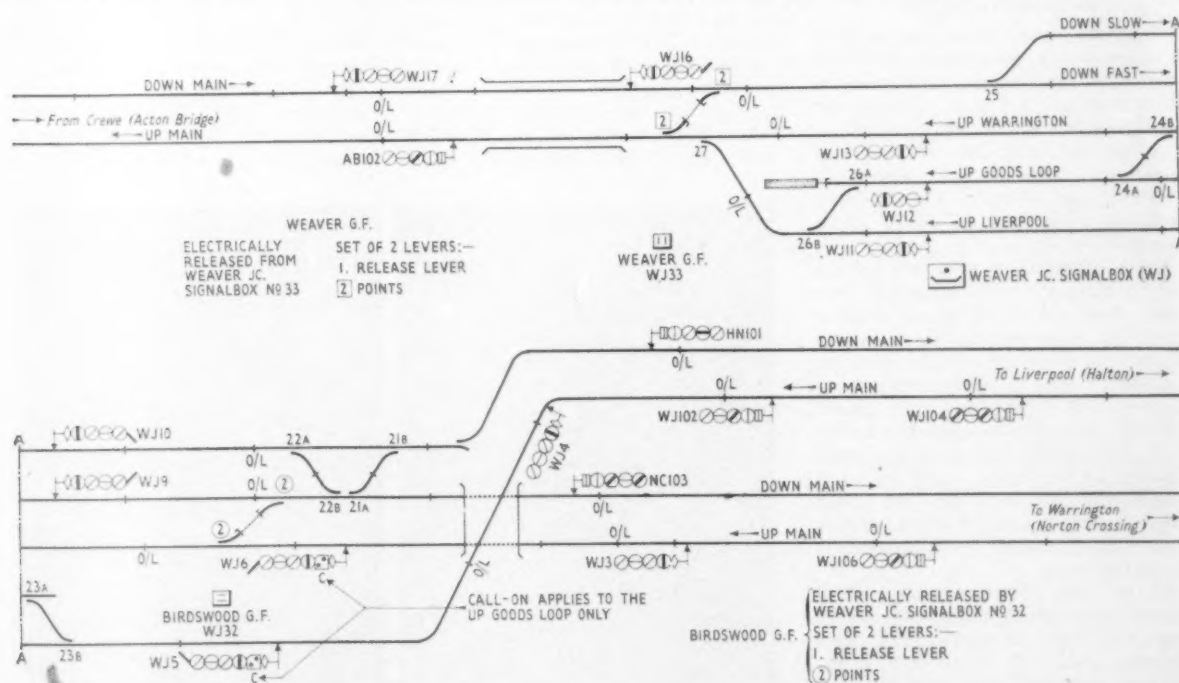


Diagram of remodelled and realigned track lay-out controlled by the new power signalling installation at Weaver Junction. Note the repositioned Up loop line which may be entered from either direction



Operating room at Weaver Junction signalbox showing push-button panel, train describer, and telephone keyboards

route is set up, the points being moved if necessary, the white lights come up along his section, and Signal 16 clears at once if set for the Down main or, subject to the prescribed approach control, for the Down slow.

The process is repeated at Signal 9 or 10 to send the train forward to Warrington. The same applies to all other moves.

Restoration of signals

These controlled signals are restored to danger as the train passes them, but do not clear again automatically when the train itself has got clear. Instead, the signalman has to pull each button as soon as the train has restored the signal to danger. The appropriate button is also pulled if it is necessary to put a signal back to danger in an emergency.

There is the usual approach locking and, so long as it is operating, the white lights show on the diagram. Once a signal has been cleared, the signalman cannot alter the route set (after replacing the signal) until a 60-sec. time-release has operated. To obtain this release, the signalman has to pull the appropriate button and hold it in the pulled position for the 60 sec., until the white route-lights go out. In the relay room there is one common electro-mechanical time-relay which is used for all time releases.

To the right of the operating panel and set at an angle to it, so as to be within easy reach of the signalman, is the train describer panel. Its upper half is the receiver instrument into which trains approaching from Acton Bridge to the south, Halton Junction on the Liverpool

line, and Norton Crossing on the Warrington line are described.

Three-sectional receiver

The receiver instrument is divided into three sections, one for each of the adjacent signalboxes. Each section has three rectangular screens on which first, second, and third train are described. The descriptions are the standard London Midland four-train numbering symbols, such as "2P57" representing the class, destination, and number of each train. The descriptions do not move forward as the train progresses. Instead as each train passes, the signalman presses a "clear out" button on the describer panel, after which the second train

moves up to "first" and so on. In addition to the three trains appearing on the screens, three more can be described and held in temporary storage.

The lower half of the panel is the transmitting instrument. To the left is a screen for each of the three adjacent signalboxes, with transmit and cancel buttons below. Indicators show either a fault or that the apparatus is "full"—i.e., that six trains have been described.

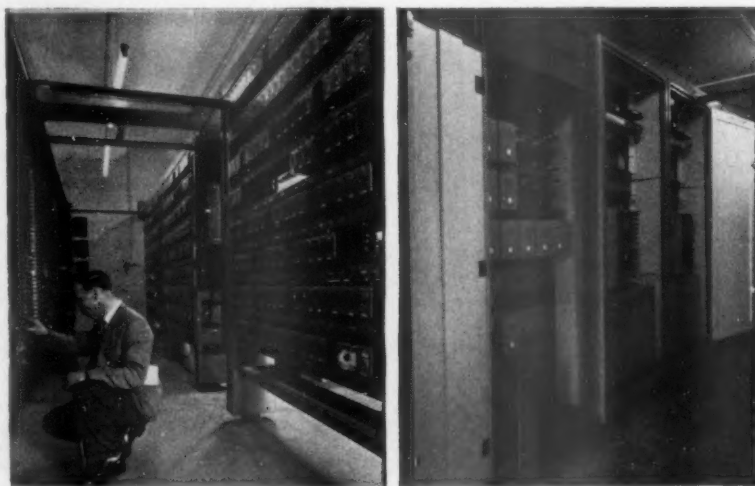
Train description

Central push-buttons are common to all three screens. These are numbered 1 to 9 and 0, and also lettered A to Z. To describe a train, the signalman first presses these centre buttons in due order (the second press setting up a letter and not a number), and then presses the transmit button for the signalbox concerned.

On the right are the emergency bell keys to the three adjacent boxes.

To the left of the operating panel, and again at an angle, there is a third panel, with indicators and switches for the signal-post telephones; means of communication with the two ground-frames; and indicators showing if a signal filament has failed. All signals are fitted with tripole double-filament lamps. If one filament burns out, the other comes in automatically, but the signalman is warned by a buzzer. He then warns the lineman who has instructions to change the defective lamp within 48 hr. If both filaments fail, the track-circuit and proving controls operate as if the signal had ceased to exist. With these safeguards there is no need for a lamp-changing roster, as the rating of both filaments is the same, i.e., 12V. 24w.

The telephone concentrator is on the train booker's desk immediately behind the signalman. The operating keys are in duplicate on each face of the con-



Left: Relay room Weaver Junction signalbox and, right, telecommunication and train describer equipment, Ditton No. 2 signalbox

centrator, so that they can be used by signalman or train booker. The concentrator is connected with all stations and signalboxes in the area, and also with the traffic and electric control rooms at Crewe and Liverpool.

All relays in the Weaver Junction relay room are of the miniature plug-in type and mounted on racks so that the installation is very compact. There are no outlying satellite relay interlockings. Over the whole of the Crewe—Liverpool line power is distributed at 650V. 50-cycle a.c. from track-section cabins spaced at 5- to 7-mile intervals.

Supply of electricity

Each cabin obtains its supply for signalling from the Local Electricity Authority at the usual domestic voltage, and raises it to 650V, by duplicate step-up transformers. The supply is distributed by two feeders, one going north and the other south, for approximately half the distance to the next cabin.

Eventually, when the full electric service is running, the 25 kV. traction supply transformed down to 650 V. will also be available as a permanent standby at each cabin. Meanwhile, each cabin is provided with a transportable diesel alternator as a temporary standby. This comes in automatically and takes over the full load within 10 sec.

of the failure of normal supply, and can run continuously for at least eight hours without attention. Weaver Junction obtains its power from the south feeder from Birdwood Cabin.

In the relay room, the incoming 650-V. signalling supply is transformed in two stages, i.e., from 650 V. to 110 V. and from the 110-V. busbars to 50 V. d.c. for relays and line circuits; also to 24 V. a.c. for train-describer displays and 12 V. a.c. for signal, point, and route-indication lamps on the panel.

Except for two crossovers, all points are electro-pneumatically operated. The air supply is obtained from duplicate electrically-driven compressors, housed in the compressor house between Birdwood Track-Section Cabin and Weaver Junction Signalbox. The compressor house also contains duplicate phase converters, for the compressors are 415 three-phase a.c., whereas the supply from the track-section cabin is 650 V. single-phase a.c.

Function of compressors

Each compressor can deliver 11½ cu. ft. of free air per min. at a pressure of 125 lb. per sq. in. One acts as the duty set and the other as the standby. The compressed air is stored in receivers and, when pressure in these falls to a pre-

determined level, the duty set starts up automatically and runs until the pressure is restored to normal. Compressed air first passes through coolers into high-pressure receivers and then through reducing valves, which reduce the pressure to 50 lb. per sq. in. into the low-pressure receivers.

Plastic air mains

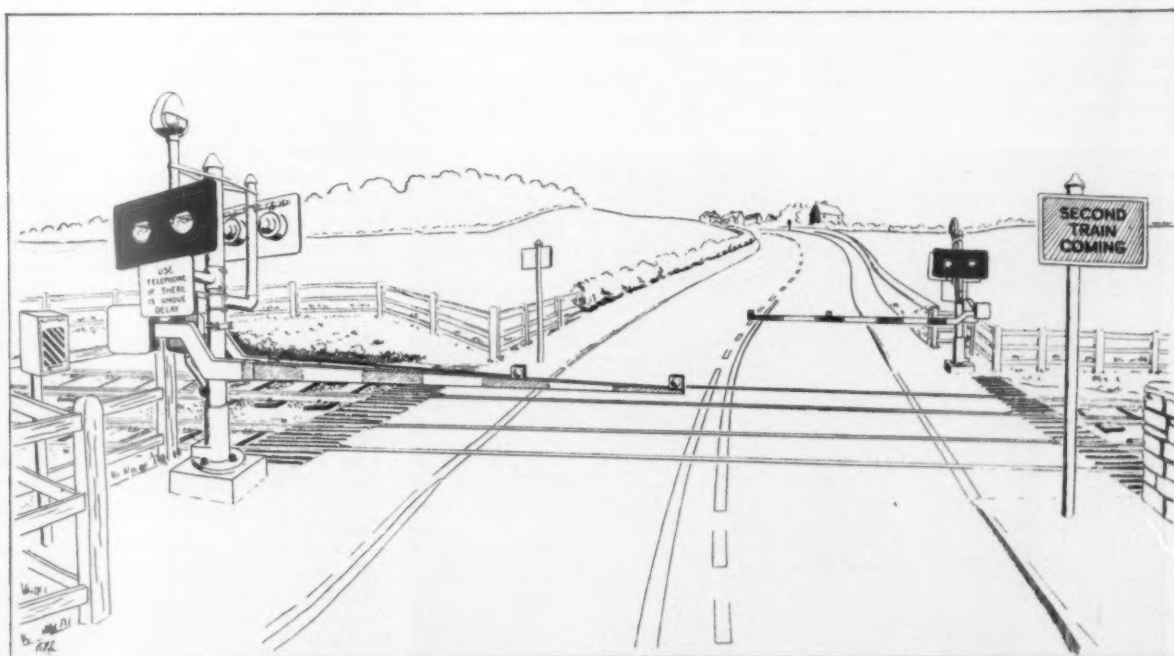
Plastic air mains are used over the whole Weaver Junction area. Additional low-pressure receivers are provided near the signalbox, and these hold sufficient air to meet any sudden demand at the end of the layout remote from the compressor house.

The work was planned and carried out under the direction of Mr. E. G. Brentnall, Chief Signal & Telecommunications Engineer, London Midland Region, British Railways.

Principal contractors were as follows:—

Power signalling, including the panel, signals, E.P. point equipment track circuits, etc.	Westinghouse Brake & Signal Co. Ltd.
Train describers, signal-post telephones	Standard Telephones & Cables Limited
Telecommunications cables and associated earthing system	British Insulated Cables Ltd.
Regulator's desk, concentrator, dial selective telephone equipment, etc.	Automatic Telephone & Electric Co. Ltd.
Electric clock system	Synchronome Co. Ltd.
Staff location loudspeaker equipment	Tannoy Products Limited

AUTOMATIC LIFTING BARRIERS AT UNMANNED LEVEL CROSSINGS



Drawing of half-length lifting barrier installed at an unmanned level crossing showing barrier in lowered position with second train approaching. This installation is similar to that described on page 175 of our issue of February 10

DIESEL-HYDRAULIC LOCOMOTIVES for South Africa

RECENT deliveries from the Hatton works of the Clayton Equipment Co. Ltd. include three diesel-hydraulic 0-6-0 locomotives for the Anglo-American Corporation of South Africa. These locomotives, which weigh 40 tons, are of the rigid-frame type, and are for mineral-wagon haulage and marshalling-yard work. The power equipment is an eight-cylinder turbo-charged Rolls Royce diesel engine, driving through a Rolls Royce Twin-Disc three-stage torque converter. Provision is made for two locomotives to be coupled and controlled from one cab.

Leading particulars are as follow:—

Gauge	...	...	3 ft. 6 in.
Wheel arrangement	...	...	0-6-0
Weight	...	...	40 tons
Horse power	...	...	350 at 1,800 r.p.m.
Maximum speed	...	...	20 m.p.h.
Maximum continuous tractive effort	...	...	23,900 lb.
Overall length	...	...	27 ft. 1 in.
height	...	...	12 ft. 0 in.
width	...	...	8 ft. 8 in.
Wheel dia.	...	...	3 ft. 6 in.
Wheel base	...	...	9 ft. 0 in.
Minimum curve negotiable	...	...	100 ft.
Fuel-tank capacity	...	...	200 gal.

The Rolls Royce vertical eight-cylinder engine type C8TFL has a bore and stroke of 5½ in. x 6 in. and is rated at 350 b.h.p. at 1,800 r.p.m. Lubrication is on the semi-dry sump system, and incorporates heat-exchanger cooling and full-flow cartridge filters. Control of the fuel-injection pump is by a mechanical all-speed governor. Movement of the driver's throttle lever is transmitted to the governor by a Westinghouse control air-valve and actuator. Centrifuge pre-cleaners are fitted to the heavy-duty oil-bath air cleaners.



Clayton 40-ton 0-6-0, showing buffer beam connections for multiple-unit operation

The radiator fan, air compressor, and vacuum exhaustor are driven by vee-belts from a power take-off at the free end of the crankshaft. Replaceable elements are fitted in the Serck radiator and the complete cooling system is pressurised. The engine protection equipment provides automatic shut-down in the event of low lubricating oil pres-

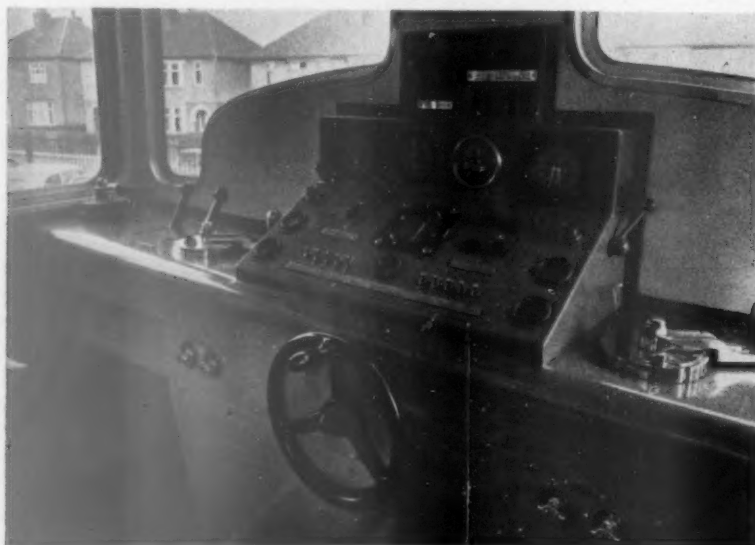
sure or excessive coolant temperature.

The Rolls Royce three-stage torque converter, type CF 11500 M 390, has a stall torque ratio of five times the input torque. This ratio varies automatically according to the load to produce the maximum locomotive speed for any throttle-lever position. Control of the converter fluid temperature is by circulation through a heat exchanger incorporated in the engine cooling circuit. If the fluid temperature is excessive, a warning bell rings in the cab and the driver reduces power until normal conditions are restored.

Clutch engagement

Fitted between the engine and torque converter is an air-operated overcentre clutch. Normally, this clutch is automatically engaged by the initial movement of the throttle lever, but a control lever is provided in the cab to permit the clutch engagement circuit to be isolated, thus allowing the engine to be speeded up without driving the torque converter.

From the torque converter, the drive is taken by a Layrub carden shaft to a Wiseman triple-reduction forward/reverse gearbox. Gear engagement for the required direction of travel is by an air cylinder. This control cannot be operated until the locomotive is stationary and an indicator light in the cab shows



Central panel provides good instrument visibility from each driving position

when the engaging dog is fully home. Pump lubrication is provided for the gears and bearings.

Cab and superstructure

The driving cab is roomy, with large windows for maximum all-round visibility. A comfortable seat is fitted at each of the duplicated driving positions, with the instruments and gauges grouped in a panel mounted centrally on the control desk. The cab is of double-skin construction, with steel sheet on the outside and a hardboard lining. Glass-fibre packing in the cavity provides heat and sound insulation. Pneumatic screen-wipers are fitted at the driving screens, and all windows are mounted in rubber mouldings. Sliding panels are provided in the side windows. On the desk are controls for the straight air-brake, vacuum brake, throttle, and forward/reverse selector. The drive-control lever, used for isolating the engine from the transmission when the locomotive is stationary, is mounted on the instrument panel. The handbrake wheel is mounted on the front of the control desk. Cab

heating is provided by two hot-water radiators with fan circulation.

Behind the cab is a short compartment containing the air reservoirs, vacuum chambers, and the batteries. In the bonnet forward of the cab is housed the radiator, engine, torque converter, heat exchanger, engine air cleaners, exhaust silencer, air compressor, vacuum exhaust, and fuel tank. All equipment is arranged to provide maximum accessibility for inspection and maintenance. Hinged lift-off doors are provided on the bonnet sides, and for major overhauls the bonnet top can be removed as a single unit.

Wheel flange lubrication

The main frame is a riveted assembly of heavy side-plates and fabricated cross-stretchers. Cow-catchers are incorporated in the buffer beams, which are bolted to the side plates. English Steel Alliance automatic couplers are fitted. Adjacent to the front buffer beam there is a step recess at each side to allow the shunter to travel safely within the profile of the locomotive. Skefko roller-bearing

axleboxes are fitted and suspension is by laminated springs. Compensating beams and a coil-spring attachment on the hangers are used to equalise the suspension. There are spring-loaded carbon-rod wheel-flange lubricators for each wheel.

Control of air brakes

Control of the Westinghouse air-brakes is by the straight air-brake valve when running light, and through the vacuum-brake valve when hauling vacuum-braked stock. At each end of the locomotive is a powerful headlight and two red marker lights. The 24-V. chloride lead-acid battery has a capacity of 232 amp. hr.

Sub-contractors for these locomotives include the following:—

Engine and torque converter	Rolls Royce Limited
Final drive gearbox	Alfred Wiseman & Co. Ltd.
Brake equipment & air-control equipment	Westinghouse Brake & Signal Co. Ltd.
Wheels and axles	John Baker & Bessemer Limited
Axleboxes	Skefko Ball Bearing Co. Ltd.
Radiator	Serck Radiators Limited
Couplers	English Steel Castings Corporation Limited
Windows	Beckett, Laycock & Watkinson Limited
Screen wipers	Trico-Folberth Limited

Grassing slopes of railway cuttings and embankments

WHEN sowing grass, particularly on newly constructed slopes, an agricultural study of the type of topsoil to be used is of much importance.

The usual aim is to produce a good permanent crop of grasses to give a pleasant appearance, and achieve stabilising and binding of the topsoil. It is also more economical, bearing in mind the total acreage of sown slopes in the British Isles, to produce grasses whose tops will die off toward the fall and so obviate cutting or burning.

Burning, unless done under expert supervision, should be avoided, as the scorched earth may result in killing the bacteria and tilth bed, and so destroying the growing properties for perhaps years to come.

The most suitable grasses for railway bank slopes, and the bunds of oil fuel installations, are easily procurable from a good seedsman, and a mixture is recommended for this purpose rather than a single species.

A suggested mixture, incorporating recommendations from the Royal Botanic Gardens, Kew, consists of equal proportions of *poa pratensis* (meadow grass), *agrostis tenuis* (common bent), *agrostis gigantea* (red top), *festuca rubra subsp. rubra* (red fescue) and *lolium perenne* (perennial ryegrass). It is advantageous to include also wild white clover because when established, this helps the permanent growth of the grass. These grasses

The choice of suitable seeds having regard to the characteristics of the top soil

by F. DUDLEY ROSE, formerly Provincial Engineer, East Tripolitania, Libya

stand up to drought and thrive in adverse conditions, but even so require a reasonable depth of topsoil. They will not grow on pure clay or very stony soil. The best months for sowing are March-April and September-October.

Some authorities suggest fescues and a percentage of white clover, on the grounds that these will grow at any time of the year. This view is not held by the author. Conditions must be right for sowing all seeds; a prolific and healthy growth cannot be expected when sown in adverse weather conditions.

Analysis of top soil

When completing an embankment which is to be sown, it always pays to have the top soil analysed. This will give an idea of mineral deficiencies in the soil and what to use to assist and strengthen the growth of grass.

If a healthy growth is required above ground, vigorous root development is needed and water, sunshine, and carbon dioxide—from the air—for leaf and flower absorption. Nitrogen, potassium salts, and phosphorous compounds are essential for the roots.

Nitrogen in the form of nitro-chalk can be applied but not until the grasses are well established, otherwise too quick a growth may be experienced and the grasses outgrow their strength. Potassium is applied in the form of potash for promoting starch content, but this is not essential for embankment grasses.

Phosphorous compounds are usually applied in the form of phosphates, such as basic slag, and bone meal, and should be fairly distributed any time when grasses are sown or at the time of sowing.

It is a matter for wonder that plants of the erica order, common heather, or ling, cannot be established, and that experiments have not been carried out with the Japanese creeping vine kudzu (*pueraria hirsuta* and *p. phaseoloides*).

UNDERGROUND FOR MONTREAL

Mr. J. Drapeau, Mayor of Montreal, and Mr. L. Saulnier, Chairman of Montreal City Executive Committee, have left Canada to discuss finance in London and Paris for the possible construction of an underground system for Montreal.

PERSONAL

Industrial

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has announced with regret the resignation of MR. H. N. EDWARDS, Chairman of the company, with effect from April 30. He will be succeeded by SIR RALF B. EMERSON. Mr. Edwards will continue as a Director. Also announced is the retirement from the board of SIR JAMES REID YOUNG, who will be succeeded by MR. A. H. HIRD.

MR. HARRY NORMAN EDWARDS, M.L.O.C.E., retiring Chairman, Metropolitan-Cammell Carriage & Wagon Co. Ltd., was educated at the Merchant Venturers Technical College, Bristol, and entered the Drawing Office of the Bristol Wagon & Carriage Works in



Mr. H. N. Edwards

1910. On the outbreak of war in 1914 he enlisted and served in the 1/6th Gloucestershire Regiment and was later commissioned in the Machine Gun Corps (Heavy Branch), later Tank Corps, and was mentioned in despatches. Mr. Edwards rejoined Bristol Wagon Works, and, after their absorption by Cammell Laird & Company in 1923, he was transferred to the Midland Railway Carriage & Wagon Company, Birmingham. In 1926 he was appointed Liaison Officer to MR. ARTHUR S. BAILEY, then Managing Director of the rolling stock subsidiary companies of Cammell Laird & Co. Ltd., with headquarters at Nottingham, and, in January, 1929, when these interests were merged with the Metropolitan Carriage Wagon & Finance Co. Ltd., he moved to the Saltley Head Office of the new organisation—Metropolitan-Cammell Carriage & Wagon Co. Ltd.—later becoming Commercial Assistant to the General Manager. Mr. Edwards was appointed Commercial Manager of the Company in 1936, Special Director in 1947, Assistant Managing Director with a seat

on the Board in 1948 and Managing Director in 1954. He was appointed Chairman of the Board in July last year, in succession to the late SIR ARCHIBALD J. BOYD. During the 1939-45 war Mr. Edwards commanded "B" Company of the 37th Warwickshire Birmingham Battalion of the Home Guard. Mr. Edwards is also Chairman of Metropolitan-Cammell-Weymann Limited, Metropolitan Railcars Limited, G. H. Sheffield & Co. (Engineers) Limited and of the Railway Carriage & Wagon Building Association and a Director of the Patent Shaft Steel Works Limited, Metropolitan-Cammell Carriage & Wagon Co. Africa (Pty.) Limited, Bus Bodies (S.A.) Limited, Union Carriage & Wagon Co. (Pty.) Limited and Zambesi Coachworks Limited.

MR. T. RICHMOND has been appointed to the board of the Titanic Steel Co. Ltd., a subsidiary of Samuel Osborne & Co. Ltd.

MR. G. C. RICHARDSON has been appointed Export Manager, Overseas Division, the British Oxygen Co. Ltd.

DR. T. U. MATTHEW has been appointed Director Manufacturing, Massey-Ferguson (United Kingdom) Limited.

MR. H. L. SATCHEL, Director of Manufacture, Associated Electrical Industries (Rugby) Limited, has retired. He is succeeded by MR. H. E. COX, Deputy Director of Manufacture.

MR. G. D. WILKINS, Secretary, and MR. G. A. SPENCER, Works Manager, Gabriel & Co. Ltd., have been appointed Special Directors. MR. H. LAWRENCE has been appointed Works Manager and MR. B. BATT, Progress Manager.

The RT. HON. SIR TOBY LOW, M.P., has been elected Vice-Chairman of the General Electric Co. Ltd. The RT. HON. LORD COLERAINE, MR. M. SOBELL, and MR. A. WEINSTOCK have been elected Directors.

MR. A. W. BAKER has been appointed General Manager of Chloride Batteries Limited in place of MR. C. PRITCHETT, who has been released for other duties in technical management within the Chloride group.

MR. E. PARKINSON, Chairman and Joint Managing Director, J. Parkinson & Son (Shipley) Ltd., a subsidiary of Crofts Engineers (Holdings) Limited, has retired. MR. H. PARKINSON has become Chairman and Sole Managing Director. MR. T. STARON has been appointed a Director.

SIR RALF B. EMERSON, C.I.E., O.B.E., M.I.C.E., M.INST.T., who is to be Chairman of Metropolitan-Cammell Carriage & Wagon Co. Ltd., was born in 1897. He was educated at Bradford College and the Royal Military Academy, Woolwich, which he joined from the ranks of the Royal Flying Corps in 1917. He was commissioned in the Royal Engineers in 1918, and served at home, in India, and in Iraq until 1927. He then transferred to civil employment with the Great Indian Peninsula Railway, and was appointed to officiate as

General Manager of that system in 1939. Subsequently reverting to military duty, he was released to take up the appointment of General Manager of the same railway in 1944. Sir Ralf Emerson became Chief Commissioner of Railways in 1946. He attended the International Railway Congress at Lucerne in 1947, and retired from the Railway Board later the same year. In 1948, he joined the boards of the associated companies in the Dowsett group and was appointed Deputy-Chairman of Dowsett Engineering Construction Limited, Dow-Mac (Construction) Limited, Dow-Mac (Plant & Transport) Limited, Dow-Mac (Quarries) Limited, and Dow-Mac (Products) Limited, and Joint Managing Director of Brooke Marine Limited. He was appointed first



Sir Ralf B. Emerson

Chairman & General Manager of the Nigerian Railway Corporation on its formation in 1955, and was awarded a Knighthood in the Birthday Honours List of 1956. In 1958, Sir Ralf Emerson handed over the office of General Manager, Nigerian Railway Corporation, to MR. R. K. INNES and returned to England, retaining his appointment as Chairman of the Corporation. He was subsequently appointed a Director of the West African Provincial Insurance Co. Ltd. of Nigeria, and is on the London board of the Provincial Insurance Co. Ltd.

MR. F. BLACKMORE, Director and General Manager, British Industrial Gases Limited, has become Manager, Equipment Development, Technical Division, British Oxygen Co. Ltd. MR. W. E. HUGHES has been appointed Director and General Manager, British Industrial Gases Limited.

MR. G. W. LACEY, Assistant Managing Director (Overseas), British Aluminium Co. Ltd., has been elected President of the Aluminium Development Association.

British Transport Commission

MR. E. W. ARKLE, Chief Traffic Officer, British Railways Central Staff, B.T.C. Headquarters, who is retiring, was educated at Marlborough and Exeter College, Oxford, joined the London & North Eastern Railway in 1923 as a Traffic Apprentice. He served in the Chief General Manager's Office at Kings Cross and in the Goods Manager's Office at York, and in 1929 was appointed Head of the Works & Docks Section, District Goods Manager's Office, Hull. He spent a year on the German State Railways studying all branches of work in various parts of the country. He then joined the Traffic & Statistical Section, Divisional General Manager's Office, York. In 1933 he was appointed Assistant District Goods Manager, Newcastle. In 1934 he became Assistant District Superintendent at Newcastle and in 1936 District Passenger Manager, Newcastle. Mr. Arkle was appointed



Mr. E. W. Arkle

Assistant Goods Manager, North Eastern Area, in 1937, and in 1940 he also took over the duties of Assistant Passenger Manager in that area. He was made Assistant General Manager, Southern Area, L.N.E.R., in January, 1943, and in June, 1945, he became Goods Manager, Scottish Area, L.N.E.R. On nationalisation he was appointed Assistant Commercial Superintendent, Scottish Region, and in March, 1949, was promoted to be Commercial Superintendent, North Eastern Region at York. In 1954 he moved to the London Midland Region as Commercial Superintendent in that Region and in May, 1957, he was appointed Director of Traffic Services. He became Chief Traffic Officer, British Transport Commission, in 1960. Mr. Arkle is a member of the British Transport Commission Design Panel.

MR. C. W. SANDERS, Assistant to Chief Accountant (Rolling Stock & Stores), Swindon, British Railways, Western Region, has retired.

MR. W. A. C. MORRIS, Dock Manager, Swansea, British Transport Docks, is to retire on July 1. He will be succeeded by

MR. E. A. C. HOWELLS, Dock Manager, Port Talbot.

MR. J. L. SIMPSON, Motive Power Officer, Line Traffic Manager's Office, Fenchurch Street, British Railways, Eastern Region, has been appointed Running & Maintenance Engineer, London Tilbury & Southend Line, Fenchurch Street, following a reorganisation.

MR. C. J. NORTH, District Motive Power Superintendent, Kentish Town, British Railways, London Midland Region, is to retire.

MR. E. C. E. LYON, Assistant Electric Traction Engineer, Chief Mechanical & Electrical Engineer's Department, Ilford, British Railways, Eastern Region, has been appointed Electric Traction Engineer, Ilford.

MR. M. HARBOTTLE, District Engineer, Derby South, British Railways, London Midland Region, has been appointed New Works Officer, London, Chief Civil Engineer's Department.

MR. F. J. BEIRNE, Assistant (Maintenance), Chief Signal & Telecommunications Engineer's Department, Finsbury Square, British Railways, Eastern Region, has retired. He is succeeded by MR. G. F. BLOOMFIELD, District Signal & Telecommunications Officer, Stratford. MR. A. PEASE, Outdoor Assistant, Finsbury Square, succeeds Mr. Bloomfield as D.S. & T.O. at Stratford.

MR. J. BROWN, Production & Work Study Assistant to the Chief Mechanical & Electrical Engineer, British Railways, Eastern Region, has been appointed Assistant Works Manager (Locomotive), Doncaster.

Overseas

MR. J. C. KENKEL, European General Manager, Canadian National Railways, has been elected Chairman of the London Freight Club.

MR. H. L. W. STEVENS has joined the Ghana Civil Service and has been appointed Chief Stores Superintendent, Ghana Railways & Harbours.

MR. L. B. GEORGE, Chief of Motive Power & Rolling Stock, Canadian Pacific Railway, is retiring. He is succeeded by MR. W. D. DICKIE, Assistant Chief of Motive Power.

MR. T. P. DEVLIN, Assistant Agricultural Director, Winnipeg, Canadian National Railways, has been appointed Chief Agricultural Officer. MR. N. A. KLODNISKI, Assistant Electrical & Mechanical Engineer, has been appointed Electrical & Mechanical Engineer at Canadian National Railways headquarters in Montreal.

MR. L. B. FREEMAN, General Freight Traffic Manager, Chicago, Canadian National Railways, has been appointed General Traffic Manager, and MR. J. L. BICKLEY, Passenger Traffic Manager, Chicago, has been appointed Assistant General Traffic Manager. The appointments are as a result of a freight and passenger sales reorganisation in the

United States by Canadian National Railways, and the office will continue to be located at Chicago.

MR. A. H. HART, Vice-President of Sales, Canadian National Railways, arrived in London, on April 24, for a 2½-week visit to the company's office in the United Kingdom.

Ministry of Transport

The Minister of Transport, the RT. HON. ERNEST MARPLES, M.P., has re-appointed MR. T. H. SUMMERSON, D.L., J.P., to be a part-time Member of the British Transport Commission until April 30, 1962. Mr. Summerston is Chairman of the North-Eastern Area Board of the British Transport Commission.

Mansion House Association on Transport

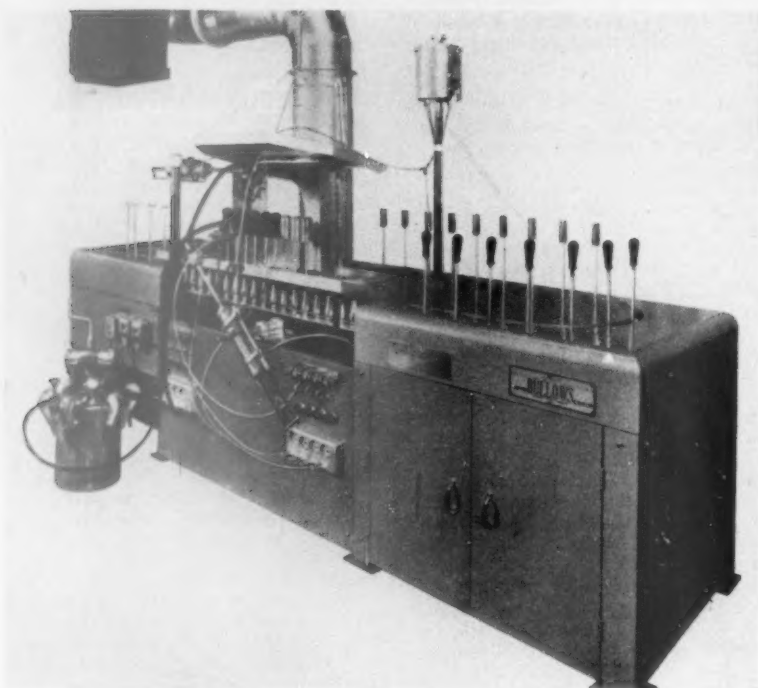
MR. ERNEST YOUNG, Transport Manager, Hadfields (Merton) Limited, who has been elected Chairman of the Council of the Mansion House Association on Transport, has served his present employers for 40 years. In 1933 he was appointed Transport Manager and, in 1949, assumed the added responsibility for warehousing. After the war he was appointed Transport Adviser to the Society of British Paint Manufacturers and serves, in that capacity, on the Associates Committee of the British Road Federation, and the Traders' Co-ordinating Committee. In 1946 he opposed the nationalisation of inland transport and is a member of the National Conference of Trade & Industry on Transport. He has been a Council Member for Merton & Morden. Mr. Young is the Hon. Treasurer of the Mansion House Association and has served on the Council and Standing Committee.

Obituary

We regret to record the death, on April 20, at the age of 85, of MR. ERNEST LLOYD, former Chairman & Managing Director of Hasler Telegraph Works Limited. Mr. Lloyd joined MR. ALFRED DAVIS in about 1905 and was taken into partnership in 1906. When Mr. Davis retired about 1909 Mr. Lloyd continued to trade as Davis & Lloyd, being the sole proprietor until, in 1921, he took into partnership MR. F. MASON. In 1946 the private limited company of Davis & Lloyd Limited was formed with Mr. Lloyd as Chairman & Managing Director. In May, 1955, Davis & Lloyd Limited were placed into voluntary liquidation on disposal of part of its interests to English Steel Corporation Limited, and Hasler Telegraph Works Limited was formed with Mr. Lloyd as Chairman and Managing Director. He retired from that position in April, 1958.

We regret to record the death, on April 21, at the age of 85, of MR. DONALD WHITE, formerly Chief Uniformed Representative, Victoria Station, Thos. Cook & Son Ltd. Mr. White was employed in the service of the company for 57 years and was well-known for his readiness to render assistance to passengers.

NEW EQUIPMENT *and Processes*



AUTOMATIC SPRAYING

Alfred Bullows & Sons Limited now produce a conveyerised automatic spraying machine, the basic units of which are a conveyor track, a spraying station comprising one spray gun, a gun traverse motion and brackets, and a down-draught exhaust system.

An electric motor drives the conveyor chain, operates the gun motions, and the automatic spray gun operating valve. The extent of the gun motion is determined by the profile of the appropriate cam. The length of spraying time is infinitely variable by means of adjustable cams.

Compressed air at 60 lb. per sq. in. is required to operate spray guns and valves.

Dependent upon the rate of production required and the type of article to be sprayed, the unit can be fitted with chains of different pitches, into which workholders fit. A standard unit has approximately 25 ft. of chain; this can be extended either when supplied or later if required. The conveyor is in constant motion and guns, when spraying, follow the work targets.

Automatic spray guns are rigidly mounted on the gun cylinder arms which are hydraulically-powered. When it is necessary to change to articles of varying sizes, adjustment is easily effected by interchanging or adjusting cam settings to cover gun motion and spraying time.

Accurate changes to predetermined spraying angles are easily made by the incorporation of calibrated gun arms.

The down-draught exhaust system is ducted vertically through the centre of the machine, opposite the spraying station. Paint-laden air is carried down to the castor-mounted separator which incorporates a system of circular baffles. The exhaust air is then taken up and out to atmosphere.

Extra gun motions can be fitted, and an additional spraying station if required. Centrifugal-type exhaust fans with necessary ducting, paint supply system and workholders, are among the many extras available.

Full information may be obtained from the maker, Long Street, Walsall, Staffs.

CLEANING GUN

Opancol Limited have placed on the market a gun for cleaning and degreasing.

This device utilises exhaust gas from an internal-combustion engine and a suitable cleaning compound mixed with water. Pressures at the nozzle end are about 150 lb. sq. in., depending upon the engine exhaust.

The gun can also be used for spraying creosote, whitewash, and insecticide. Additionally, with a flame attachment, it will burn brush, weeds, and oil from floors.

Details are available from Opancol

Limited, 20 Took's Court, Cursitor Street, London, E.C.4.

DRUM STORAGE

An "on-the-roll" drum storage system developed by Dexion Limited uses a shock-absorbing arrester gate and bevelled timber runners to minimise damage to barrels.

On-the-roll storage installations, incorporating sloping tracks along which the stored drums roll as earlier stock is used, have advantages in terms of stock rotation, space saving and ease of handling.

Importance was given in the Dexion design to the problem of damage caused to drums. The timber runners, with their bevelled edges, guide drums effectively and provide safety.

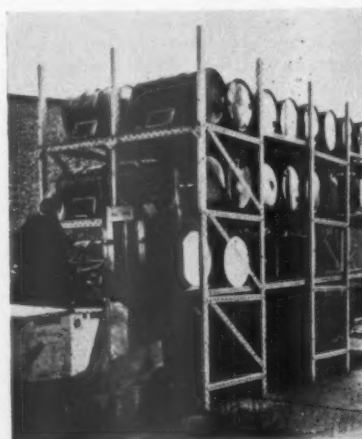
The spring-loaded arrester gate cushions the impact of the rolling drum, reducing both damage to the drums and shock to the framework of the rack. It is capable of stopping two or three drums at once, thus permitting fast input and removal.

The gate is operated by an ingenious automatic lever device; although the stop-bar stands 8 ins. high when it is arresting the drum it drops to only one inch when the drum is lifted for removal from the rack.

Tests have shown that these racks could safely accommodate in one runner length up to 12 drums each of 500 lb.

The Dexion arrester gate is designed to be operated by the hoops (or chimbs) on the drum, and in its present form is not suitable for smooth drums. The company is prepared to consider adaptations if the demand arises.

Full particulars of the arrester gate and racking are available from Dexion Limited, Maygrove Road, London, N.W.6.



PVC WATERSTOP

A polyvinyl chloride (PVC) waterstop, intended to obviate the use of a sealing compound, and withstand the severe buffeting caused by wave action and high seas, has been produced by Expandite Limited. It may also be used for other applications, such as culverts, where a PVC waterstop is suitable for the conditions, and where the absence of a sealing compound will be an advantage.

The waterstop is based on the makers' hydrofoil profile to which has been added a hollow portion, at right-angles to and in front of the waterstop, to fill the cavity between adjacent pours of concrete. At the back, the profile is slotted to take $\frac{1}{2}$ in.-thick joint filler.

The waterstop is manufactured from high grade PVC with suitable plasticisers and contains no fillers or scrap material. At 25 deg. C. it has a tensile strength of 2,000 lb. sq. in. (min.). Elongation at break is 250 per cent (min.); B.S. softness, 42-52; water absorption, 2.5-3 per cent. The cold crack temperature is not higher than -25 deg. C.

In a number of cases, PVC is more resistant to chemical attack than natural rubber, particularly with respect to oxidation.

Fuller information may be obtained from the maker, Chase Road, London, N.W.10.

COUNTER

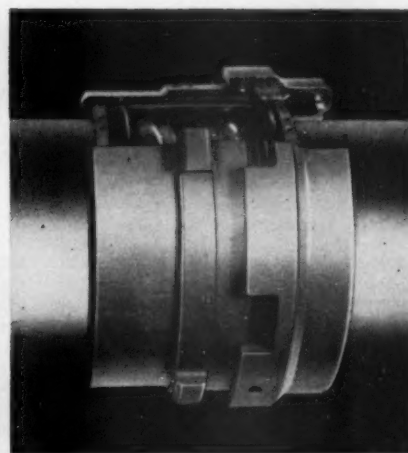
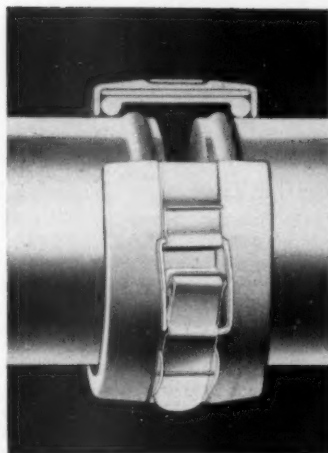
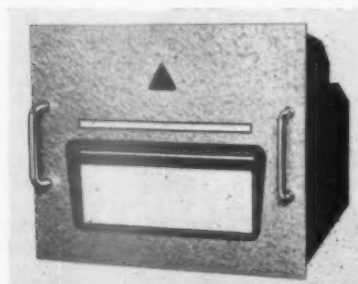
The Telephone Manufacturing Co. Ltd., has added printout unit assemblies to its range of Elmeg counters.

These assemblies will record the results from many separate electrical impulse sources in one operation. The largest of the four assemblies now available accommodates a maximum of 12 5-digit printout counters, or a total of 36 single-decade counters, all resettable.

Suitable for panel or rack mounting, the assemblies provide a permanent record of any measurement that can be passed to the equipment as an electrical impulse.

The example illustrated accommodates a maximum of seven printout counters, or a time printer, or the equivalent number of single-decade counters.

Full particulars are available from the maker, Martell Road, London, S.E.21.



FLEXIBLE COUPLINGS

Aero Controls Limited are now marketing three new types of the A.C. flexible coupling.

Intended normally for use in fuel, hydraulic, pneumatic, and lubricating systems, the new couplings can be adapted for use with corrosive fluids.

The chief feature is that they permit both axial and angular deflection of the pipes and a misalignment of up to $\frac{1}{8}$ in. is acceptable when fitting. Expansion joints are rendered unnecessary in pipes so joined.

Tubes are beaded or flared at the ends to prevent pulling out through the seal under unrestrained conditions.

Three types of these couplings are available. A screw-type with "O" ring seals, a lightweight version with a twin-headed seal, and an industrial design for heavy-duty applications. This last-mentioned type also incorporates a twin-bead seal.

All couplings are unaffected by vibration or temperature variation. Sizes available are from $\frac{1}{4}$ in. to 9 in. dia.

Full particulars are obtainable from the maker, Industrial Estate, Weedon Road, Northampton.

NYLON TUBE

Polypenco Limited announce a complete range of nylon tubes, designed to extend the availability and uses of nylon bearings in industry.

Nylon, a tough, crystalline thermoplastic, has gained widespread acceptance as a suitable bearing material for small components, due to its outstanding wear and abrasion resistance properties and ability to operate with little or no lubrication. Lack of availability and the high cost of larger nylon shapes has hitherto prevented the use of Nylon for bearings in the general engineering industry.

One hundred and sixteen standard sizes of MC nylon tubes, ranging from 2 in. O.D. x 1 in. I.D. to 15 in. O.D. x 14 in. I.D. are now offered.

MC nylon may be readily machined into components such as bearings, bushings, guides, slideways, valve seats, gears and other wearing parts from tubes, plate, discs, and square, round or hexagonal rod.

It is claimed that lubricated nylon bearings will operate under similar load and speed conditions to orthodox phosphor bronze bearings and will often out-perform the latter material. A feature of MC nylon is the fact that it is only one-seventh the weight of an equivalent-sized bronze bearing, the new material is reported to be comparable in price to best quality bearing bronze.

Full particulars may be obtained from the maker, 68, Tewin Road, Welwyn Garden City, Herts.

BOX FASTENER

"Self-lock" and "Absolock" fasteners have been introduced by the Granby Box Co. Ltd., to secure the lid and base of its product, the plywood folding box, and to enable the box to be converted into a permanently rigid type of container.

The former type of fastener consists of lengths of mild steel angle riveted to the top or bottom edge of the box side, and fitting into a groove in the lid or base. It is semi-permanent and can be unfastened easily, but tensional steel strapping is needed in addition to provide security during transit. This fastening is capable of repeated use.

The "Absolock" consists of a combination of plywood strip and a flanged length of mild steel, and can be set either internally or externally. It is designed to give complete security, during transit, against rough handling and pilferage, without the need for steel strapping or nails.

The slight extra cost of these fastenings is said to be more than offset by savings in time.

Further details may be obtained from The Granby Box Co. Ltd., 359, Canal Road, Bradford, 2, Yorks.

SPECIAL REPORT FROM THE SELECT COMMITTEE on Nationalised Industries

Summary of a White Paper comprising the views of the British Transport Commission and of the Ministry of Transport

A White Paper published on March 28, 1961, contains the following comments on the report of the Select Committee on Nationalised Industries.

Observations of the B.T.C.

The Commission pointed out that the Acts of 1947 and 1953 required the Commission to be regarded as one undertaking. Although the 1953 Act withdrew the obligation to provide "adequate" services except in the London area, it left the Commission with a duty to pay due regard to the needs of public and industry.

Superannuation (paragraph 15)

The Commission agreed with the suggestion that the present method of accounting for superannuation funds should be discussed with the Ministry and the Treasury.

Wagon turnaround (paragraphs 365 and 366)

The Commission agreed that wagon turnaround time must be improved.

Staff and productivity (paras. 367 and 368)

The committee had stressed the importance of progress in work study. The Commission agreed with the committee on this matter.

Technical staff (paragraphs 369 and 370)

In the last four years, the Commission had increased its technical staff by one-third. The measures taken had not been sufficient to counteract the shortage, and further action was under consideration.

Accounting and costing (paras. 373 and 374)

Two matters were dealt with under this head:—

- (a) production of separate Profit and Loss Accounts for each Region;
- (b) costing of individual services and operations, and the assessing of profits by significant groups of services and individual transits, whether local or inter-Regional.

(a) Separate Regional accounts

The Transport Act, 1953 had laid down that railway reorganisation must deal with the computation and publication of statements of Regional operating costs and statistics, as distinct from Regional accounts. In 1954, the Railways Reorganisation Scheme had dealt at some length with this question.

The Commission drew attention to the difficulties of preparing a profit and loss account which would "significantly reflect either the revenues and expenditures really attributable to a given area or the relative efficiencies of area managements"; it was urged that the needs of managements and of Commission control would best be met by a combination of costing and statistics with the existing form of financial accounting.

(b) Traffic costing

The Commission believed it was well to the fore in the field of railway traffic costing.

A large proportion of railway costs was common to a wide variety of services and transits and the costs of individual services and transits varied greatly with the nature

and circumstances of traffics and operations. Railway costing, therefore, was a matter of greater complexity and less precision than the costing, for example, of manufacturing processes.

In conjunction with the development of Regional Accounts, it was proposed to develop procedures for the systematic allocation of railway working expenses (other than track and signalling) over the main freight traffic flows and passenger services, for comparison with the receipts.

The Commission felt that the comments in the second sentence of paragraph 360 and in paragraph 374 of the committee's report did not take account either of the efforts made to grapple with these intricate problems or of the progress achieved. The work involved in the further developments now planned must not be underestimated.

Examination of projects (paragraph 387)

In connection with the committee's recommendations on modernisation schemes, the Commission submitted that a competitive business needed reasonable freedom to move. The machinery of approval should be quick and limited to the essentials.

The Commission endorsed the conclusion of the committee that the expected return on major investments should be subject to examination by the Ministry.

The machinery recently introduced, which provided for the examination of projects costing more than £250,000, involved the consideration of relatively small projects successively by Area Board, Commission and Ministry, and the Commission had already represented that, in its opinion, this limit should be substantially raised.

Yield on investment (paragraphs 384 to 390)

The committee dealt with two associated matters:—

- (a) Tests applicable in judging financial results expected from an investment, and
- (b) What yield should be estimated on any investment.

On (a), the Commission noted the committee's conclusions as to the two tests which should be applied and agreed that there were two relevant financial criteria:—

- (i) additional net return to be secured by each proposal;
- (ii) overall profitability—after the proposal had been carried out—of the affected service.

The second of these tests could be made only in certain cases.

On the question of what the return ought to be, the Commission agreed with the end of paragraph 390 (although it pointed out that "central charges" would already cover interest on the loan capital).

London Midland electrification (para. 393)

The Commission welcomed the committee's conclusion that this scheme should be completed as soon as possible.

Land and property (paragraph 403)

The Commission's views on the restrictions exerted on property development were submitted to the Minister by the Chairman on January 26, 1960. The Commission hoped that present restrictions could be eased to enable it to turn its property to good account.

Forward commitments (paragraph 409)

Although the Commission had been asked yearly to forecast its investment requirements for three years ahead, it had not so far been given to understand that its budgets beyond the first year had been given general approval and it had been unable to do its forward planning in the assurance that future requirements would be met. The Commission regarded it as most important that it should be given reasonably firm indications of the investment it was likely to receive over a five-year period, so that it could work to a carefully prepared programme.

In the Commission's view, there should be a five-year timetable of work related to forecasts of annual investment.

Transport tribunal (paragraphs 410 and 411)

The Commission had already submitted to the Minister its views about the future of the Transport Tribunal. The Commission had asked that the Tribunal's jurisdiction over freight charges should be abolished.

If there was to be statutory control of passenger fares applicable to suburban services in the London area, the Commission accepted that the Transport Tribunal was an appropriate authority for fixing maxima, but was of the view that it should be entitled to increase its fares without prior reference to the Tribunal, seeking the Tribunal's confirmation after the event.

The Commission welcomed the suggestion that the levels of maximum charges fixed by the Tribunal should be adequate to cover depreciation charges, provision for replacement and provision for reserves.

Provision of services on grounds of national economy or social needs (paras. 420-4)

The committee proposed that the decision whether particular "unprofitable" services were to be provided should be taken not by the Commission but by the Government, which should then bear the cost.

Apart from the merits of the committee's proposal in principle, very difficult questions would arise, first, in defining what constitutes the "service" in each particular case and, second, in computing the loss.

Public attention had so far largely been focused on the closure of unremunerative branch lines or the withdrawal of passenger services. In such cases, there was, in general, no problem of definition.

The gross receipts of a "service" arose partly from local and partly from through traffic; in the latter case, the loss would often not be confined to the local section of the journey, i.e., contributory or feeder values had to be considered.

As regards the costs of a particular "service," there were four important alternative bases of estimation:—

- (a) the immediate savings if the service were discontinued, i.e., the short-term marginal costs; or
- (b) the savings in the long-term if the service were discontinued, i.e., the long-term marginal costs; or
- (c) the full allocated costs, exclusive of track and signalling; or
- (d) the full allocated costs, inclusive of an attribution of track and signalling costs.

At the first stage, it would presumably be necessary to define the specific services which the Commission would wish to discontinue and to estimate the loss on each to obtain a Government decision on whether the service should be discontinued, continued as it is, or continued in a modified form.

The preparation and agreement of claims on the Ministry would be a major task; even more so, if each case had to be re-examined regularly in the light of changing circumstances.

In brief, the Commission recognised the inherent merits of this proposal. It had felt it necessary to emphasise the technical difficulties in its implementation. It would not like it to be interpreted as a rule that every piece of the system that might be, perhaps temporarily, unremunerative must be closed unless the Government would subsidise it. Nor would it subscribe to the view that this proposal would solve all the financial problems of British Railways.

Matters specifically for railway management

In so far as the committee's report referred to matters specifically the province of railway management, the Commission was giving close attention to those matters.

Observations of the Minister of Transport

Parliamentary questions (paragraph 62)

The committee, in referring to Parliamentary Questions which were framed in a way critical of the Commission, commented that the Commission, being unable to defend itself in the House could only turn to the Minister to do this for it; but he had not got the statutory responsibility, and might not have the wish to do so.

In the Minister's view there should be no departure from the accepted principle that he could answer only for matters within his responsibility.

The Ministry's organisation (paras. 63, 406)

The committee referred to some misgivings at the Ministry itself about the Department's equipment to carry out its general responsibilities in relation to certain aspects (e.g. traffic assessments) of transport throughout the country. The Ministry's organisation for this purpose was being strengthened.

Pension funds and similar (paras. 150-4)

The committee considered that the Commission, in consultation with the Ministry and the Treasury, should examine present arrangements for investing superannuation funds and railway savings banks deposits. This was being done.

Departmental study (paras. 161 et seq., 222, 393-6)

The committee was critical of the way in which the Modernisation Plan was given governmental backing without detailed consideration and technical investigation.

In this connection it was necessary to bear

in mind the different circumstances obtaining at various stages in the evolution and implementation of the Modernisation Plan.

The original plan was produced in 1954. In the light of the developing situation in 1956, and the representations made by the Commission about its financial position, the Government considered it necessary to obtain further documentation about the plan and its overall financial prospects.

As railway prospects worsened, the Minister requested a reappraisal. This was published in July, 1959. Close study of the reappraisal (which was not endorsed by the Government) and its implications led on to a full examination of the various aspects of the Commission and of the railways in particular. The Minister concluded that certain important aspects of the plan would have merited closer detailed examination and that arrangements should be made for a tighter control over the Commission's investment: in particular, control (as from February, 1960) over investment in new major projects.

The first step was to establish that individual schemes costing more than £250,000 should be examined by the Ministry. This measure alone would not, in the Minister's view, suffice to secure the closer supervision of large capital expenditure recommended by the Committee in H.C. 187 of 1957-58. The procedure for the examination of individual schemes is, therefore, being supplemented by the preparation and examination of investment programmes covering the Commission's plans, for the railways and for the Commission's other activities, over a period of four years. Particular attention is given to the detail of these programmes for the immediately following year.

Until these procedures had been fully worked out, the Minister did not think it desirable that the figure of £250,000, at which the Ministry's examination of investment projects begins, should be increased.

Land and property (paras. 244-51, 404)

The committee referred to the statutory restrictions on property development by the railways, and to the action the Commission had taken to make good use of its property assets. It recommended that the utmost use should be made of these assets.

The views of the committee were accepted, not only in relation to the railways, but also as applying to all the activities of the British Transport Commission.

Railway workshops (paragraph 262)

In the view of the committee, some adjustment of railway workshop facilities was inevitable in the circumstances of the industry today, and the Commission was right to go ahead with such adjustment now. This view was accepted.

Research (paragraphs 305 to 309)

The committee expressed the view that the Commission would gain by spending more money on research.

The Minister was giving serious and urgent attention to research in view of his responsibilities under Section 4 (3) of the Transport Act, 1947, and it was proposed that the Minister should retain these responsibilities. Meanwhile, the Ministry, the Department of Scientific & Industrial Research, and the Commission were co-operating in an examination of railway requirements and practice in research and its application, with special regard to the extent to which use could be

made of existing facilities in this country.

Organisation (paras. 357-9, 363)

The committee drew attention to deficiencies in the present organisation of the Commission now that "the main emphasis in its role had changed to the efficient running of a large-scale business under the most competitive conditions." It criticised the absence of a single authority whose only duty was to ensure an efficient system of railways.

These observations were taken into account in considering what changes were required in the structure of the Commission's undertakings and in framing the Government's proposals. These proposals appeared to accord with the committee's views.

Regional accounting (paragraphs 373, 374)

The Government attached considerable importance to regional accounts for the railways, and welcomed the Commission's decision that arrangements should be put in hand for producing them. The Government's proposals contemplated the maintenance of regional trading accounts by each of the Regional Railway Boards.

Electrification scheme (para. 393)

The committee expressed doubts about certain aspects of this scheme, but concluded that it should go ahead.

After consideration of all the factors involved, the Government agreed.

Fares and charges (paras. 407-8, 411)

The committee expressed views on the bases on which fares and charges were computed, on the activities of the Transport Tribunal and on the effects of Ministerial intervention in these matters.

The committee recommended that "in all fields where the railways are meeting effective competition, there was no need for the [Transport] Tribunal."

It was proposed that (except as regards fares in the London Passenger Transport area) the present restrictions on the ability of the railways to adjust freight charges and passenger fares quickly and adequately should be ended. It was the Government's view that increases in railway fares and charges must make their due contribution towards meeting railway costs.

Unprofitable services (paragraphs 415, 417)

The Government had recorded its view that the practical test for the railways, as for other transport, was how far users were prepared to pay economic prices for services provided. It had thus largely endorsed the committee's view. The Government must reserve its views on the committee's suggestion that uneconomic services which the railways were required to provide on grounds of the national interest, or of social needs, should be made by specific grant. It was pointed out that, for the time being, railway losses of any such services would in practice be covered from public funds.

Size and shape (paragraph 420 et seq)

The size and pattern of the railway system was a major problem for both Commission and Ministry. In considering it, it would be necessary to have regard to the development of other forms of transport, and present and future trends of traffic. To this end, the Minister had set up, with the Commission, a study group in which the modernisation programme and also the Commission's broad proposals for rationalisation of the railway system could be examined.

Staff & Labour Matters

Application for shorter working week

At a meeting of the Railway Salaries National Council held in London on April 19, a statement was made on behalf of the British Transport Commission that, provided satisfactory arrangements could be agreed between the parties as to the manner in which the reductions in the working week could be implemented so as to ensure its efficient and economic application, favourable consideration would be given to granting a reduction in the shorter weekly working hours to 42 for conciliation staff and 40 for salaried staff.

It was stressed by the Commission that a joint working party comprising representatives of the Commission and of the three trade unions should be set up to examine the problems involved.

The trade unions intimated that they would report back to their executive committees and inform the Commission of their views.

Railway running sheds

Workers employed in railway running sheds will be covered by the safety, health, and welfare provision of the Factories Acts from July 1. The T.U.C. and British Transport Commission have agreed to this extension of the Acts' application and the railway trade unions have welcomed it.

British Railways staff—claims for shorter working week

At a meeting of the Railway Staff National Council on April 19, representatives of the British Transport Commission offered to reduce the standard weekly hours of railway conciliation staff from 44 to 42 a week, and from 42 to 40 a week in the case of railway salaried staff, subject to satisfactory arrangements for maintaining efficiency and economy.

The Commission representatives suggested that a joint working party should be set up to examine ways and means of implementing the reduced hours.

A similar offer for railway workshop staff was made by the Employers' representatives

at a meeting of the Railway Shopmen's National Council on April 20.

These offers, which are being considered by the unions' executive committees, were in response to claims for a reduction of 4 hr. in the standard working week. T.S.S.A. points out that many railway clerical staff already work no more than 38 hr. a week, and it is unfair to discriminate between different sections of the salaried staff. The reduction in hours, which has generally been adopted in outside industry, has been of the order of 2 hr. less in the working week. A.S.L.E.F. has already signified its acceptance of the Commission's offer, including the setting-up of the working party. It has stated that its policy will be to secure the implementation of the 42-hr. week on the basis of an additional rest day, making three in all, being rostered each four weeks in place of two rest days as at present.

"Open Forum" at Colchester

The Eastern Region of British Railways held its first "Open Forum" at Colchester on April 19. A film, "The British Transport Commission's second report on modernisation," was shown to open the meeting, and Mr. H. W. Few, Traffic Manager (Liverpool Street), explained what was happening on British Railways. The panel consisted of Mr. W. G. Thorpe, Line Traffic Manager (Great Eastern), Chairman; Mr. Few, Mr. G. M. Booth, District Operating Superintendent (Liverpool Street), Mr. R. H. N. Hardy, District Running & Maintenance Engineer (Great Eastern), and Mr. H. Kinsey, District Commercial Officer (Liverpool Street).

Questions in Parliament

Pitsea rail crash

Mr. Edward L. Gardner (Billerica—Lab.) asked the Minister of Transport on April 19, whether he had any statement to make on the rail crash near Pitsea.

Mr. Ernest Marples said that at about

1.30 p.m., the 12.25 p.m. Fenchurch Street to Shoeburyness passenger train, which was proceeding over the Up line on account of prearranged engineering work on the Down line, became derailed at a point about half-a-mile on the London side of Pitsea Station. The engine turned over and the leading two coaches telescoped badly. The third and fourth coaches were derailed and damaged. There were about 150 passengers in the train, two of them were killed and 42 injured, 36 passengers were detained in hospital, 25 were still in hospital. The emergency services responded rapidly to calls for help. During the evening rush period, trains from Fenchurch Street for Pitsea and beyond were diverted via Tilbury, and an emergency bus service was introduced between Laindon and Pitsea. Normal services were operating the following morning. Colonel Robertson, an Inspecting Officer of Railways, went immediately to the site of the accident and will hold a formal inquiry.

Mr. H. P. G. Channon (Southend W.—Con.) asked the Minister if he agreed that the accident was, in part, caused because there was single-line working along the line owing to the work on overhead electrification. Would he do what he could to ensure that such work was carried on at a time when there was not heavy traffic along the line?

Mr. Marples said he would not like to anticipate the findings of the inquiry, but would take note of what had been said.

Parliamentary Notes

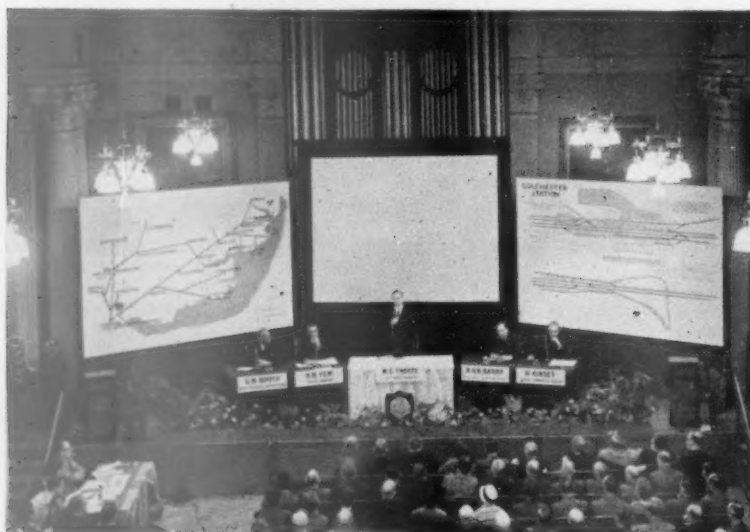
Statement in the House of Lords

In the House of Lords, on April 19, Lord Chesham, Joint Parliamentary Secretary to the Ministry of Transport, made a statement about the rail crash at Pitsea.

The Earl of Lucan associated the Labour peers with the expression of sympathy; echoed his thanks to the local people and to the emergency services, and congratulated the Transport Commission on their speedy return to normal services by next morning.

He thought that there would be concern on learning of the high casualty rate. Nearly one-third of the passengers on the train became casualties, most of them serious and were still detained in hospital. It would also seem from the statement, that the casualties were largely due to the fact that the two leading coaches telescoped badly. What he wanted to know from H.M. Government was whether they agreed that this incident underlined the need for speeding up railway modernisation. Over a year ago he had heard of the danger, in a crash such as this, of using old-fashioned wooden coaches. Until the Transport Commission got on with and completed its programme of modernising railway stock, there would always be the danger that tragedies such as this would be repeated.

Lord Rea asked that the attention of the Minister of Transport should be drawn to the fact that, when a great disaster like this occurred, out of the goodness of their hearts people run to help and incur considerable expenditure in regard to their own personal goods as well as effort. Many of them were often out of pocket as the result of being good Samaritans. They should be put in a suitable position to draw on any funds that may be available.



Mr. W. G. Thorpe speaking at British Railways Eastern Region "Open Forum" at Colchester

CONTRACTS AND TENDERS

Contracts for modernisation work on British Railways

British Railways, North Eastern Region, has placed the following contracts:—

G. Stephenson Limited: provision of office accommodation for the Police Department at South Stockton Goods Station

Automatic Telephone & Electric Co. Ltd.: supply and installation of an extension to the telephone exchange at York

Berwick Building Co. Ltd.: provision of four relay rooms for signalboxes at West Jesmond, New Bridge Street, Jesmond, and Manors

Raines, H. & V. Ltd.: supply of heating and a hot water service installation at Holbeck Motive Power Depot, Leeds

S. MacLean & Son Ltd.: provision of a dust extractor plant for the Chief Civil Engineer's Workshops at Darlington Park Lane

Pavior Construction Co. Ltd.: reconstruction and widening of road Bridge No. 23 over the Leeds-Doncaster line at South Elmsall

Derek Crouch (Contractors) Limited: preliminary site works for the new signal-box and compressor house at Gateshead

MacLaughlan (Knottingley) Limited: earthworks, drainage, ballasting and fencing at the new marshalling yard at Stourton

Finlay Engineering Co. Ltd.: provision of a "Finlay" hydraulic rail straightening press for the rail welding depot at Dinsdale

Durham Steelwork Limited: reconstruction of the superstructure of Bridge No. 102, Albert Hill, Darlington

J. W. Ellis & Co. Ltd.: design, supply, and erection on prepared foundations of structural steelwork, and cladding for screens for carriage washing machines at Heaton and South Gosforth.

British Railways, Scottish Region, has placed the following contracts:

Holland & Hannen and Cubitts (Scotland) Limited: reinforced concrete work for office block, Sighthill goods depot, Glasgow

Kinnear, Moodie & Co. Ltd.: repairs to Gourock Pier

Grant Lyon & Co. Ltd.: laying of permanent way, Gartcosh sidings

Alexander Lindsay Limited: electrical installation for yards and signalboxes at Kilmarnock

John Boyd & Co. (Engineers) Ltd.: provision of new carriage traverser, Carriage & Wagon Works, St. Rollox, Glasgow

Murdoch MacKenzie Limited: reconstruction work on Bridge, Uddingston-Motherwell line

J. Drysdale & Company: reconstruction and raising of Muirend Overbridge No. 135 at Muirend Road

Communication System Limited: supply

and installation of a control telephone system south of the River Clyde, in connection with the Glasgow suburban electrification.

BOARD OF TRADE

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Iraq:

120 km. track length (or 240 km. length) steel rails 90 lb. per yd. or nearest of 36 ft. length flat bottom, with necessary fittings (fishplates, fish bolts and nuts, and bearing plates to suit dog spikes $\frac{1}{2}$ in.) of internationally approved specification, process and properties.

The issuing authority is the Director-General, Iraqi Republican Railways Services, Baghdad, to whom bids should be sent. The tender No. is IRRS/R/6/61. The closing date is May 10, 1961. The Board of Trade reference is ESB/12953/61.

From South Africa:

25 10-ton goods vehicle chassis, with or without cabs

25 heavy mechanical horses, with or without cabs

25 fifth wheel couplers, suitable for mechanical horses.

The issuing authority is the Stores Department, South African Railways. Bids should be sent to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. Bids in sealed envelopes should be endorsed "Tender No. F. 8619: Goods Vehicle Chassis and Mechanical Horses." The closing date is May 12, 1961. Local representation is essential. The Board of Trade reference is ESB/12949/61.

From Formosa:

485 spring steel flat bars, 2.4 x 20 x 5,500 mm. (1,000 kgs.), for use in railway freight car construction, AAR specification M-112-49, or equal

325 sets of axle box guides for railway freight car construction.

The issuing authority is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan, to which bids should be sent. The tender No. is U.S. 881-1, which must be quoted in all correspondence with the Central Trust of China. The closing date is May 25, 1961. The Board of Trade reference is ESB/13608/61/I.C.A.

From Pakistan:

1 heavy duty conservancy truck with steel tipping body and a detachable 350 gal. capacity night soil tank similar to Bedford M.L.C. type or Thames 10 cu. yd. refuse loader.

The issuing authority is the Pakistan Eastern Railway, Pahartali, Chittagong, to which bids should be sent. The tender No. is P5/EC/36/60. The closing date is June 15, 1961. Local representation is considered

desirable. The Board of Trade reference is ESB/13630/61. No further information is available at the Board of Trade.

50 tons of $\frac{1}{2}$ in. steel mild round
155 tons of $\frac{3}{4}$ in. steel mild round
20 tons of $\frac{1}{2}$ in. steel mild round
50 tons of $\frac{3}{4}$ in. steel mild round
50 tons of 1 in. steel mild round.

The issuing authority is the Chief Controller of Stores, Pakistan Eastern Railway, Pahartali, Chittagong, to whom bids should be sent. The tender No. is P2/GB4/266/60. The closing date is May 8, 1961. Local representation is considered desirable. The Board of Trade reference is ESB/13190/61.

From Greece:

1 portable drilling machine
1 multi-drilling machine
6 portable electric welders
2 portable devices for filling tyres
1 instrument for measuring T.D.S.I. in water.

The issuing authority is the Purchasing & Stores Department, Hellenic State Railways, 34 Themistocleous Street, Athens, to which bids should be sent. The tender No. is 5026. The closing date is May 12, 1961. Local representation is essential. The Board of Trade reference is ESB/13119/61.

From Victoria:

Manufacture, supply, delivery, installation, testing and setting to work of two steam generators complete with all necessary equipment, on foundations and in a building provided by the Corporation at a site at the South Dynon Diesel Locomotive Depot, Melbourne, Victoria.

The issuing authority is the Secretary, Victorian Government Railways, Melbourne, C.I., to whom bids should be sent. The tender No. is 61897. The closing date is May 3, 1961. The Board of Trade reference is ESB/13126/61.

From Australia:

2 sets re-railing equipment for handling rolling stock on 5-ft. 3-in., 4-ft. 8½-in., and 3-ft. 6-in. track.

The issuing authority is the S.A. Supply & Tender Board, P.O. Box 495E, Gawler Place, Adelaide, to whom bids should be sent. The tender No. is S93. The closing date is May 22, 1961. The Board of Trade reference is ESB/12186/61.

From Egypt:

Supply of chains.

The issuing authority is the Purchases & Stores Department, Railway Building, Shoubra Subway, Cairo, to whom bids should be sent. The tender No. is E.R.305. G.8/292. The closing date is May 15, 1961. The Board of Trade reference is ESB/12433/61. No further information is available at the Board of Trade.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

NOTES AND NEWS

Prices of semiconductors. International Rectifier Co. (Great Britain) Ltd., have announced reductions in the prices of their semiconductors.

Plastics exhibition. The sixth International Plastics Exhibition will be held at Olympia, London, from June 21-July 1. Visits have been arranged for parties from 26 countries.

Passenger train to be withdrawn. The Southern Region of British Railways will withdraw the 11.50 p.m. train from Victoria to the Kent coast from June 12 because of lack of passengers.

Southern Region goods yards to close. As an economy measure the Southern Region of British Railways is to close the goods yards at Wraybury, Datchet, and Windsor Riverside. Goods consigned to these places will be delivered by road from Staines.

Beyer Peacock recovery. The Beyer Peacock group of locomotive engineers last year turned a loss of £1,592 into a net profit of £178,581—this after £143,283 (£73,682) taxation. The dividend on ordinary £1 shares is to be 12 per cent.

Refreshment facilities at Bradford Station. A restaurant and lounge bar was opened by the Hotels & Catering Services of the British Transport Commission on April 19 at Bradford (Forster Square) Station, together with the existing cafeteria, which was modernised in 1955, it provides completely up-to-date facilities.

New advertisers on British Transport sites. Four advertisers, new to British Transport advertising sites, are among those who have recently booked space on a wide scale in London buses and Underground trains. They are: Eastmans Limited, the Dyers & Cleaners; Fines Employment Agency; Evans Marshall & Co. Ltd., and William Nuttall Limited. Other advertisers include Ardath Limited; Phillips Yeast Products Limited; and the National Coal Board. All are regular users of other British Transport media.

Eastern Region "runabout" tickets. The Eastern Region of British Railways is to issue "holiday runabout" tickets valid in 11 different areas. The cost of the tickets will be from 25s. to 42s. 6d. according to the area covered and they will be on sale from April 30 to October 28. Special folders showing detailed maps of the areas, fares and places of interest are now available at stations, offices, and agencies.

New signalbox at Coventry. Work has begun on what will be one of the most modern electronic signalboxes in the world at Coventry. The project will cost over £500,000 and marks the latest stage of the redevelopment of the station commenced in 1957 and scheduled for completion by the end of next year. The two-storey signalbox will be capable of operating points 60 miles away by remote control and is expected to be in

use next year. Signalling will be on a "traffic-light" principle and penetrating beams, effective during fog, will be visible for long distances. Electronic equipment will be used to send out signals which will be picked up by control rooms and railway telephone exchanges.

Commonwealth training week. Commencing on May 29, the City & Guilds of London Institute will hold its Commonwealth Technical Training Week, an idea initiated by the Duke of Edinburgh after he had seen a similar scheme in operation in Australia. Prince Philip is President of the City & Guilds of London Institute.

M.A.N. at Hanover Fair. Maschinenfabrik Augsburg-Nürnberg A.G. are showing many of their products at the forthcoming German Industries Fair, April 30-May 9. Exhibits range from turbines to cranes and include a neutron diffraction spectrometer, built for research into the atomic structures of materials.

Birmingham Railway Carriage & Wagon Co. Ltd. The Birmingham Railway Carriage & Wagon Co. Ltd. is not paying a dividend for the year to December 31, against 7½ per cent and a tax-free capital distribution of 7½ per cent for 1959. A group loss of £255,151 compares with a profit of £71,508, after tax reliefs of £41,981, against a tax charge of £69,042. The balance of revenue reserve of £929,013 has been set aside to provide for losses which are expected to be incurred on uncompleted contracts and for the cost of the cancellation of the London Transport Executive contract.

Queensland Transport Minister's visit. The Queensland Transport Minister will arrive in London on May 15. He is visiting Britain to study rail and road transport problems and to obtain information on the latest trends in railway development. The Assistant Secretary of the Railway Department and the Locomotive Engineer at Rockhampton will accompany him. They will spend about a fortnight in Britain, and will have discussions with British Railways and Board of Trade officials, and with representatives of British organisations engaged in the manufacture of rolling stock and equipment.

Holiday travel trends in 1961. Nearly 30 million people, 58 per cent of the population, took holidays away from home in 1960. This was revealed by a survey carried out last year by the British Travel & Holidays Association. This figure was slightly lower than that for 1959, which was a brilliant year for weather, but was still substantially higher than all previous years. The survey showed that holiday spending in 1960 totalled £550 million, compared with £465 million in 1955 and £380 million in 1951. July and August were, as usual, the most popular months and were chosen by 64 per cent of all holiday-makers. The survey also revealed important changes in methods of transport since they were last studied in 1955. Last year 47

per cent of holidaymakers travelled by car, compared with 34 per cent in 1955 and 21 per cent in 1951.

European journalists visit Britain. Thirteen journalists from leading newspapers in the European Free Trade Association are visiting this country, until May 1, as guests of the British Iron & Steel Federation. The visit has been arranged to encourage the closest possible exchanges between member countries of the Association, and will include not only visits to steel works, but contact with other important industries and Members of Parliament. The tour will end with a dinner on May 1 given by the President of the British Iron & Steel Federation.

Railway Preservation Society. The Hampshire Narrow Gauge Railway Preservation Society, recently formed to preserve narrow gauge locomotives and equipment has acquired a 0-4-0 saddle-tank engine built by Bagnalls in 1919. The Society is in negotiation with British Railways for a length of disused railway road-bed with the intention of constructing eventually about four miles of route on which "rides" can be given.

Metal and plastic symposium. The Metal & Plastic Coatings Association will hold a symposium on May 9 at 2.30 p.m. at Earls Court at which papers will be read by J. A. Rhys (F. W. Berk & Co. Ltd.); J. F. Stanners (British Iron & Steel Research Association), and Dr. L. Valentine, Paint Research Station. Further information is available from the Secretary of the association, 189, Brent Crescent, North Circular Road, London, N.W.10.

Commonwealth training week overseas. Aden held its Commonwealth Technical Training Week from April 1-8. Most of the Commonwealth Countries will hold their week at the same time as the United Kingdom but in Hong Kong it will be from April 24-30 and in Malaya, Nigeria and Pakistan it will be in the second half of May. British Honduras, Ghana, India, Rhodesia & Nyasaland, Seychelles and Singapore will hold their weeks in the autumn for climatic and educational reasons.

Costa Rica Railway Co. Ltd. Sir Robert Adeane, Chairman, who presided at the annual general meeting of the Costa Rica Railway Co. Ltd. on March 30, said that the Northern Railway had had another satisfactory year and the total volume of traffic had been a record. There had been some increasing costs and the total net profit of the Northern Railway before charging rental had been £146,656. The amount received by the Costa Rica Railway Co. Ltd. from the Northern on account of rental was virtually unchanged at £87,000.

Sandycroft station to close. The London Midland Region of British Railways has announced that Sandycroft station, between Chester and Flint, will be closed for all traffic except that for private sidings on and from Monday, May 1. Passengers should book to Chester or Queensferry according to direction of travel. The area is served by buses of Crosville Motor Services Limited. Parcels, passenger train merchandise, horse boxes and prize cattle vans will be dealt

with at Queensferry. Freight traffic, except that for private sidings which will continue to be dealt with at Sandycroft, will be handled at Chester or Queensferry.

Toronto Show. Morganite Exports Limited, a member of the Morgan Crucible Group, will be exhibiting a range of their products at the forthcoming National Industrial Production Show. This will be held in Toronto, May 8-12.

Elimination of level-crossing. Hessle Road (Dairycoates) level-crossing on the Hull-Leeds line is to be eliminated. A new bridge will carry the A.1105 road over the line just south of the crossing; this will have 22-ft. dual carriageways, and two 9-ft. footpaths forming the approaches from Brighton Street and Devon Street. The Minister of Transport has granted £496,927 to Kingston-upon-Hull County Borough Council toward the cost of eliminating the crossing, and the British Transport Commission will pay £137,965. The total cost of the scheme will be £803,034.

Road Transport Education report, 1960. The National Committee on Road Transport Education annual report for 1960 deprecates the small number of entrants from goods transport undertakings for the transport examinations of the Royal Society of Arts. Ways in which employers can assist have been suggested and it was proposed that arrangements should be made for local colleges to send employers a supply of enrolment forms. The Royal Society of Arts booklet "Examinations in Road Transport Subjects, 1961" is available, price 6d., from the Examinations Department, 18 Adam Street, W.C.2.

Electronic Computer Exhibition. Major advances in computers and ancillary equipment will be seen at the forthcoming exhibition, to be held in the National Hall, Olympia, October 3-12. The joint organisers are the Office Appliance & Business Equipment Trade Association and The Electronic Engineering Association.

Crossley Bros. Ltd. An interim report from Crossley Bros. Ltd., states that there is an improvement in that the company is working overtime in all factories, and the output is up. Prices are still low, and in addition there have been two increases in wage rates totalling 9 per cent within 12 months in the industry. Diversification has been actively pursued, but will take time to show financial results, so the directors do not feel justified in declaring an interim dividend on the deferred ordinary stock.

Go-as-you-please ticket. All-day train travel in Kent for 16s. is facilitated by a go-as-you-please ticket issued by the Southern Region, and available every day except Saturdays this year until October 27. At all but the smallest stations, where the ticket must be asked for on the day previous to requirement, bulk supplies of tickets will be held.

Eskdale Railway in use. The Ravenglass & Eskdale Railway, which was saved from closure last summer by a hastily formed preservation society, has made a return to public working. Some hundreds of visitors have been carried on the 15-mile return trip between the Cumberland coast and the village

of Boot during the Easter holiday. British Railways helped by running special trains from Workington and Whitehaven. The opening proper is on May 13 and the line has been closed again until that date for track clearing, weeding and general maintenance.

Festiniog Railway engine re-named. The Festiniog Railway's double Fairlie locomotive "Talesin" was re-named "Earl of Merioneth" at Minfordd on April 22. The title is one of those borne by H.R.H. Prince Philip, and permission was sought from His Royal Highness for the re-naming. The ceremony was conducted by Mr. Oswald Thomas, who is a local dignitary and a member of the Welsh Tourist Board.

Model locomotive presented to Stoke-on-Trent. To mark the golden jubilee of the city of Stoke-on-Trent, Mr. David Blee, General Manager of the London Midland Region of British Railways, presented a model of Coronation class locomotive No. 46254 "City of Stoke-on-Trent" to the city on April 21. The illustration which appears on this page shows Alderman Sir Harold Clowes, O.B.E., J.P., receiving the model from Mr. David Blee, watched by Mr. Gordon Dale, J.P., Lord Mayor of Stoke-on-Trent.

British Transport advertising at Advertising Services Exhibition. British Transport Advertising is to be represented at the second Advertising Services Exhibition to be held at the Corn Exchange, Brighton, from May 3-6, inclusive. Colourful pictorial displays, showing the variety of sites available, will support the central theme of "British Transport Advertising Creates New Markets." The displays include an illuminated cut-out map illustrating the areas served by British Railways and the British Transport Commission's nation-wide bus fleets, as well as photographs of poster sites on buses, stations, vans and roadside positions. An animated and illuminated clock will show the extensive time posters on transportation sites. A

special issue of "Transad News," the British Transport Advertising journal, is being published to coincide with the opening of the Exhibition.

New staff accommodation at Oxford. A new block comprising staff amenities and offices is to be constructed by the Western Region of British Railways at Oxford Running & Maintenance Depot. This will replace the existing accommodation, which consists of a number of detached buildings and cabins, now totally inadequate for present needs. The new premises, centrally heated, will be of brick construction with timber panelling infill and will provide office accommodation for the Shed Master and his staff, an engine-men's lobby, mess-room to cater for 60 staff, lavatory and washing facilities, cloak and locker rooms, a mutual improvement classroom and a first-aid room. The new building was designed by Mr. R. L. Moorcroft, A.R.I.B.A., Regional Architect, under the direction of Mr. M. G. R. Smith, M.I.C.E., Chief Civil Engineer, British Railways, Western Region.

Opening of Consett new Plate Mill. The North Eastern Region of British Railways played an important role in the assembly of large numbers of guests who visited the North East to attend the formal opening of Consett Iron Company's new Plate Mill on April 26. A special train composed of First Class sleeping cars conveyed over 100 guests from London and the South. Leaving Kings Cross just after midnight, the train arrived at Newcastle early on that morning and the guests breakfasted in the Royal Station Hotel. Many of the ordinary train services were strengthened to accommodate guests travelling from Liverpool, Manchester, Sheffield, Glasgow and Edinburgh, and a meals service was provided. A special diesel train conveyed guests from Newcastle Central Station direct into Consett Iron Company's Siding. The special trains to and from London carried headboards and side indicator boards painted in the blue and yellow colours of the Consett Iron Company.



Sir Harold Clowes accepting the model locomotive "Stoke-on-Trent"

Public relations in marketing. A one-day conference will be held by the British Institute of Management at the Connaught Rooms, London, on May 16, to put before the delegates the practical use that is being made of "Public Relations in Marketing." Three speakers will discuss three aspects of the subject, for the company, Mr. J. Campbell Fraser, Public Relations Officer, Dunlop Rubber Co. Ltd., for the advertising agency, Mr. T. H. Traverse-Healey, Director, F. C. Pritchard, Wood & Partners Limited, and for the independent consultant, Mr. Colin Hodgkinson, Chairman & Managing Director, Hodgkinson Partners Limited. A senior executive, Mr. N. L. Rigby, Managing Director, Nabisco Foods Limited, will take the chair for the day, and, together with the speakers, will be joined in a question-and-answer session by a representative of a national newspaper.

B.E.T. Omnibus Services. The financial results and final dividends of B.E.T. Omnibus Services Limited for the year ended March 31, 1961, show the net profit for the year (after providing £373,146 for taxation) to be £548,666 (£513,809). On the £4,500,000 issued Ordinary Stock (as increased by the £1,500,000 capitalisation issue on November 7, 1960), a final dividend of 5 per cent free of tax was declared, making 8 per cent for the year. Last year, the final dividend was 8 per cent free of tax, making 12 per cent free of tax for the year on £3 million, equivalent to 8 per cent free of tax for the year on the present capital of £4,500,000.

Railway Stock Market

The French developments, which highlighted growing uncertainty about international affairs, halted the rise in stock markets that followed the Budget, but the reaction was moderate, selling having been much less in evidence than had been feared earlier in the week. Second thoughts on the Budget with its absence of tax incentives to industry have tempered more optimistic views. Nevertheless, it is generally believed that the outlook for export trade is improving and that the £ should remain strong this year, so that the Chancellor will not have to use the Payroll tax and other special powers to regulate the home market.

Canadian Pacifics, reflecting the general market trend, came back from \$45½ a week ago to \$43½, though the 4 per cent debentures at 58½ and the 4 per cent preference stock at 59½ were well maintained. White Pass shares have changed hands around \$10½.

Foreign rails showed little movement, quotations being tested by very few dealings. Following the publication of the annual report, San Paulo Railway 3s. units remained at 1s. Costa Rica ordinary stock was again quoted at 39½ with the first debentures 39½ and second debentures 125. Moreover, Chilean Northern first debentures were again quoted at 50. Paraguay Central debentures were 18½, while United of Havana second income stock remained at 6½, but there was little business to test the quotation.

French railway sterling bonds were unaffected by the French developments, Midi 4 per cents again being 85½.

Nyasaland Railways shares remained at 11s. and the 3½ per cent debentures at 33½.

West of India Portuguese capital stock was 117½ and Barsi Light Railway 17.

In other directions, International of Central America eased from \$22½ to \$21½; the preferred stock was \$112½.

Shares of locomotive builders and engineers have not kept best prices, but in a number of cases were higher on balance as compared with a week ago. Despite the financial results, which confirmed the warning already given by the directors, shares of Birmingham Wagon have risen to 36s., which compared with 28s. 6d. a week ago. Vague talk of take-over possibilities and mergers have continued to circulate, though they are without confirmation. North British Locomotive rose further on balance from 9s. 3d. to 10s. 3d., while Charles Roberts 5s. shares at 8s. 9d. held most of the improvement recorded a week ago. In other directions, Gloucester Wagon 10s. shares improved from 10s. 6d. to 11s. Beyer Peacock 5s. shares held steady at 7s. 9d. on further consideration of the results.

Vickers have been a good feature with an advance on balance from 33s. to 36s. 9d. in response to the higher profits and maintained 10 per cent dividend, but in electricals there was a reaction from 47s. 3d. to 45s. 3d. in A.E.I., profit-taking having followed the chairman's annual statement. English Electric were maintained on balance at 37s. 6d. and G.E.C. at 37s. 3d. little changed on balance. Westinghouse Brake gained a few pence at 42s. 3d. but in other directions, following the financial results, Pressed Steel 5s. shares receded from 32s. 4½d. to 31s. Dowty Group 10s. shares came back from 40s. 3d. to 39s. 6d.

Stone-Platt strengthened afresh to 66s. 3d. at which there is a yield of 4½ per cent on the basis of last year's 15 per cent dividend. Babcock & Wilcox have been steadier at 36s. on the financial results, but Richardsons Westgarth 10s. shares moved back from 8s. 3d. to 7s. 9d. T. W. Ward rose on balance from 77s. 6d. to 80s. and British Oxygen 5s. shares were higher at 35s. 3d. In machine tools, Craven Bros. 5s. shares strengthened to 11s. 3d. on following the surprise increase in the dividend from 7½ per cent to 8½ per cent.

Forthcoming Meetings

April 28 (Fri.). The Railway & Canal Historical Society, West Midlands Group, at the Engineering Centre, Stephenson Place, Birmingham, 2, at 7.15 p.m. Film show.

April 29 (Sat.). Railway Correspondence & Travel Society, East Midlands Branch, Vale of Belvoir tour. Special train leaves Nottingham Midland at 1.40 p.m.

May 2 (Tue.). The Institution of Civil Engineers, at Great George Street, London, S.W.1, at 5.30 p.m. "New tunnels near Potters Bar in the Eastern Region of British Railways," Mr. A. K. Terris, and Mr. H. D. Morgan.

May 3 (Wed.). The Electric Railway Society, at the Fred Tallant Hall, 153 Drummond Street, N.W.1, at 7 p.m. "The background to the Glasgow suburban electrification," Mr. J. C. Train.

May 3-4 (Wed.-Thu.). Railway Modernisation Conference. Joint conference with the Institution of Electrical Engineers, the Institution of Civil Engineers, and the

Institution of Mechanical Engineers, at the Institution of Civil Engineers at Great George Street, London, S.W.1.

May 4-7 (Thu.-Sun.). The Institution of Electrical Engineers, Electronics & Communications Section. Visit to Cologne.

May 6 (Sat.). The Branch Line Society, Bathgate & District railtour, departing from Maryhill Central at 1.50 p.m. to Avonbridge and Fauldhouse, returning to Glasgow Queen Street at 9.20 p.m.

May 6 (Sat.). The Railway & Canal Historical Society, at the Queen Hotel, City Road, Chester, at 6.30 p.m. Annual general meeting.

May 6-7 (Sat.-Sun.). The Railway & Canal Historical Society, canal trip from Anderton Lift to Runcorn, and coach tour of Wirral Railways.

May 8 (Mon.). The Historical Model Railway Society, London Section, at Keen House, Calshot Street, London, N.W.1, at 7 p.m. "Pre-group signals," Mr. E. I. Vaughan.

May 9 (Tue.). The Institution of Civil Engineers, at Great George Street, London, S.W.1, at 5.30 p.m. "Auckland Harbour bridge: design," Mr. G. Roberts, and Mr. O. A. Kerensky, and "Auckland Harbour bridge: construction," Mr. H. Shirley Smith, and Mr. J. F. Pain.

May 10 (Wed.). The Institution of Electrical Engineers, Supply Section, at Savoy Place, London, W.C.2, at 5.30 p.m. "Electricity supply in India and its future," Mr. M. Datta.

May 10 (Wed.). The Permanent Way Institution, Nottingham & Derby Section. Visit to the Butterley Co., Ltd. engineering works.

May 10 (Wed.). The Railway Students' Association. Visit to Paddington Station.

May 12 (Fri.). The Institution of Locomotive Engineers, at 1, Birdcage Walk, London, S.W.1, at 5.30 p.m. "The Sir Seymour Biscoe Tritton Lecture," Sir Brian Robertson.

May 12-13 (Fri.-Sat.). The Institution of Electrical Engineers, Utilisation Group. Visit to Llandudno.

May 13 (Sat.). The Permanent Way Institution, London Section, visit to works of Exors of James Mills Limited.

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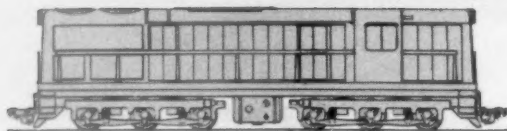
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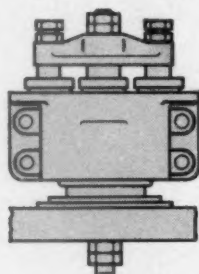
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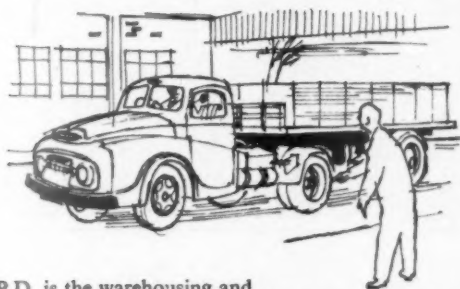
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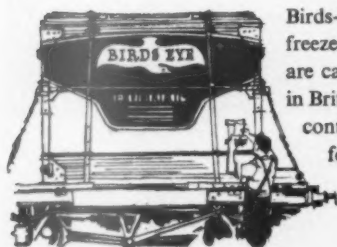
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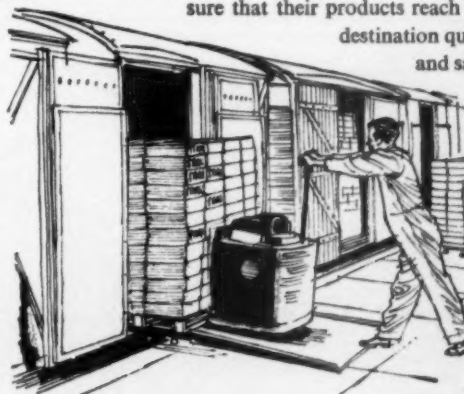
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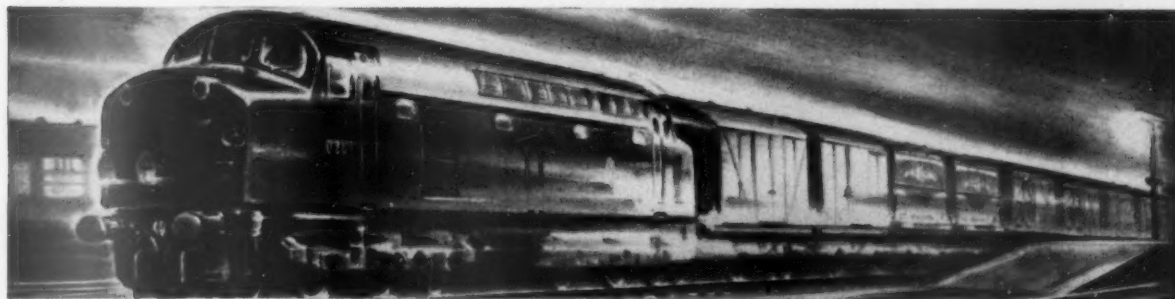
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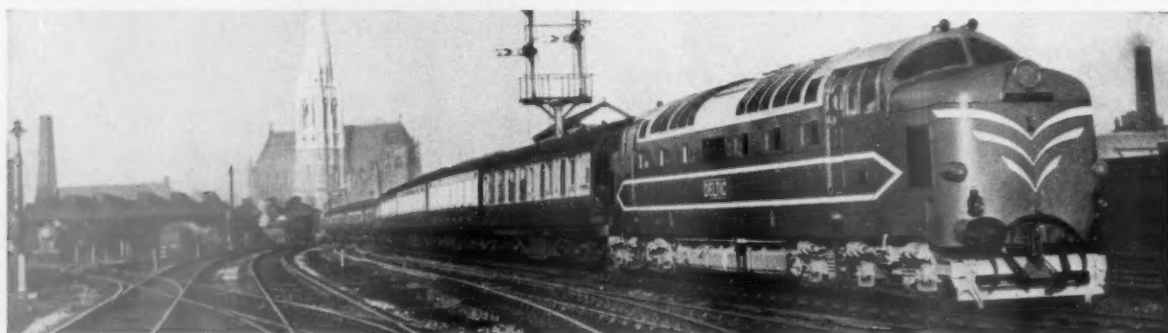
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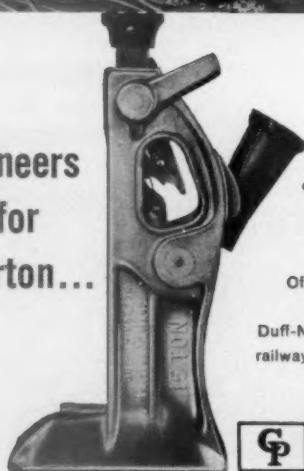
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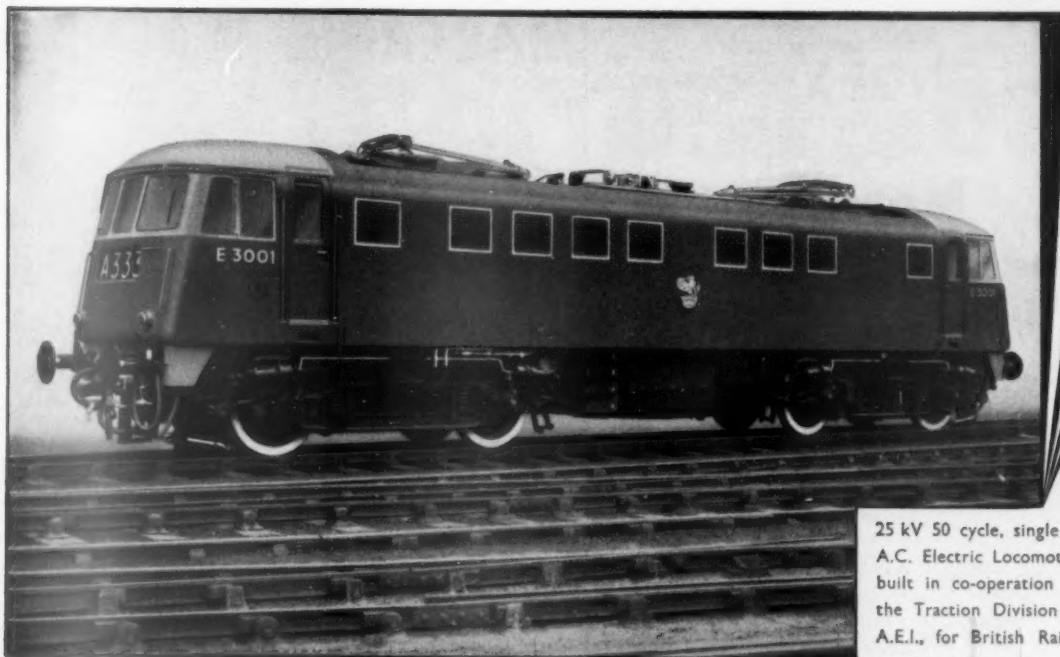
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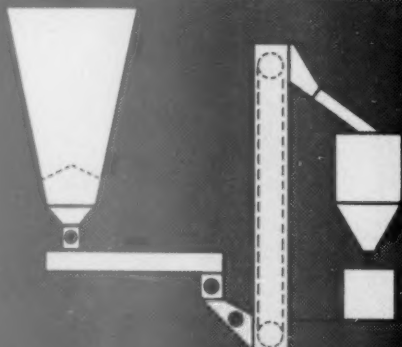
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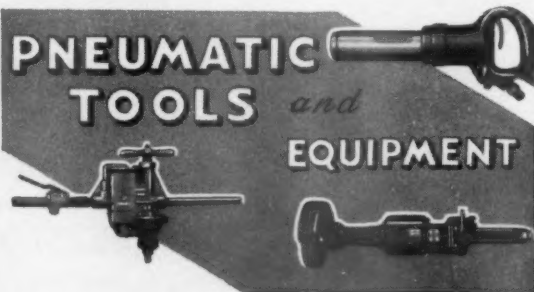
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